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Traffic Engineering

Official Publication of the Institute of Traffic Engineers

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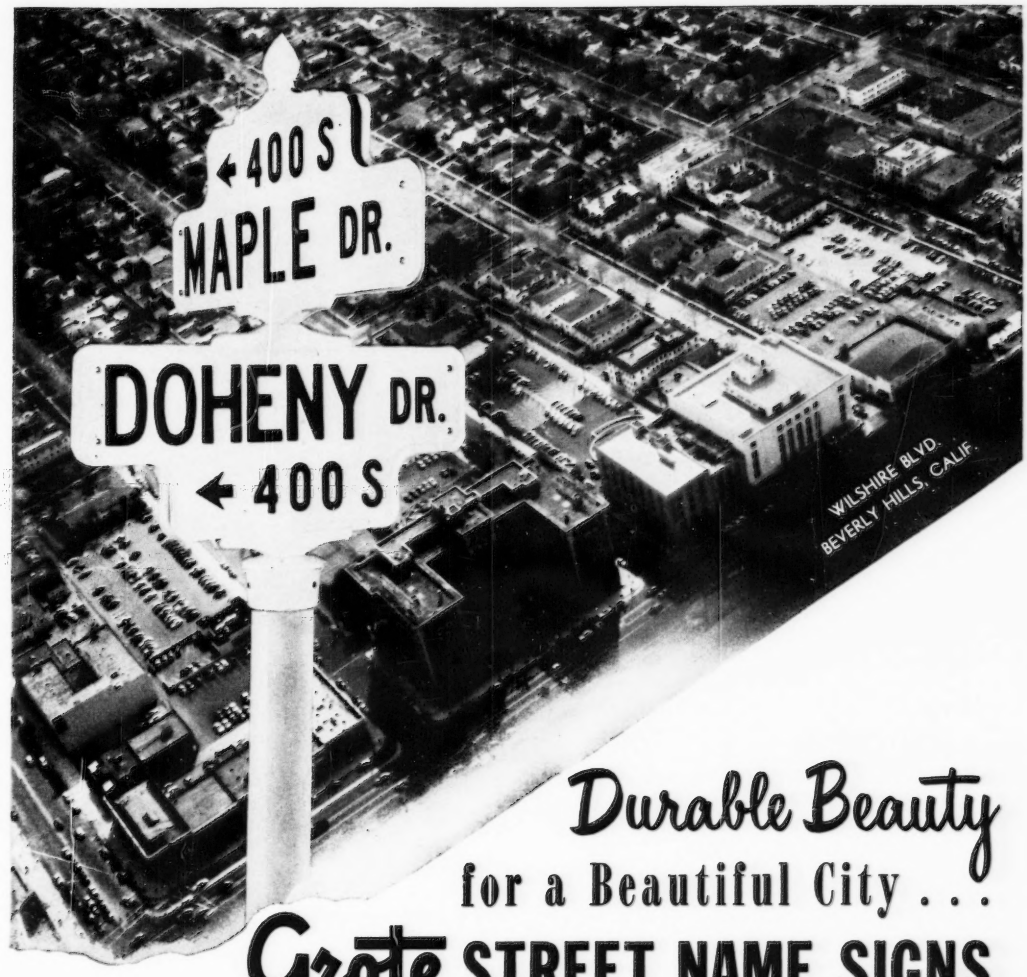

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXI | OCTOBER, 1950 | NUMBER 1

COVER: View of Knightley's open air parking garage recently constructed in Wichita, Kansas. The garage has a capacity of 600 cars. This rear view photograph shows the unique ramp design.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

TOGETHER with the passing of another year in the life of the Institute of Traffic Engineers, we are confronted with an event which is a significant one in the life of any organization, the stepping aside of a capable and respected leader, Past President Wilbur S. Smith. The passing of an experienced leader is a significant event not only because of the uncertainty a new and untried chief always presents, but because it also presents an opportunity to the organization to demonstrate that it has sufficient unity and stability to survive and continue to grow under the democratic principle of rotation in office. That the Institute has such unity and stability is now beyond doubt.

The Institute has grown from a membership of 30 in 1930 to over 500 today. But, what is more important, it has grown not only in numbers but in character and influence. The Institute has been a vital force in raising the status of the profession of traffic engineering to the point where it is now recognized as an essential need in meeting the demands of motorized transportation which is so vital to our economic and social life.

The progress of the Institute and the recognition which it enjoys today would not have been possible without the self-sacrificing services of the officers and members of the Institute ranks who contributed freely of their time and cooperative effort through the Institute to the development of the science of traffic engineering.

An outstanding achievement of the Institute through the cooperative effort of its members which was brought to a conclusion this year, was the preparation and publication of a revised and greatly improved edition of the TRAFFIC ENGINEERING HANDBOOK. The compilation of the Handbook was a cooperative achievement of the highest order.

Space will not permit giving credit here to all of those who contributed to the preparation of the Handbook. Recognition is given them in the Handbook itself. Special credit, however, is due Henry K. Evans, Secretary of the Editorial Board, who at personal sacrifice of time and effort edited the various chapters and prepared much of the final text. Special recognition is also due Julian H. Harvey and Robert J. Allen who handled the administrative details incident to the printing of the Handbook, to Robert A. Mitchell, Chairman of the Editorial Board, and to W. Graham Cole whose Handbook Committee activated the movement which culminated in the preparation and publication of the new Handbook. The Handbook is an essential in every traffic engineer's library.

Another outstanding achievement during the past year was the improvement in the magazine, TRAFFIC ENGINEERING. Due to the effort and direction of Robert S. Holmes, the capable Executive Secretary of the Institute, with the assistance of his staff, the magazine now has a much more effective format. Not only has the size and general appearance of the magazine been greatly improved making it more readable, but the character of its contents has been improved also. The magazine is now in the front rank of engineering society publications.

The revised Handbook and the improved magazine are steps in the path of progress to which the Institute can point with satisfaction. They are material proof that the Institute of Traffic Engineers is a stable and coherent organization.

The Institute has come a long way since its founding. It has made progress but we should not become self-satisfied. It will take the continued active cooperation of all the members of the Institute if we expect to make further progress. The Institute cannot go forward on its initial momentum. Every committee member should take an active interest in the work of his Committee. The Committees of the Institute are not intended as empty honors but are designed to round out the objectives of the Institute.

Because of the threat of a third World War, this may be a critical year in the life of the Institute. The Institute is a comparatively youthful organization and many of its members are likely to be called into the armed services. This may mean the loss of their active participation in the affairs of the Institute for an indefinite time. Those who are left will have to carry on.

The Institute must continue, regardless of what sacrifices some of its members may have to make in the war effort, to develop and expand its activities.

Henry E. Riegel
President

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Parking Problems of American Cities

By Theodore M. Matson (Mem., ITE)
Director, Bureau of Highway Traffic
Yale University, New Haven, Connecticut

PERHAPS one of the most vexing and frustrating situations which arises in connection with automobile use is that experienced when one is seeking a satisfactory place to park his car after he has arrived at his destination in the central business district of a city or town. If convenient curb parking is permitted, he usually finds that the few available spaces have been pre-empted. If an open stall is found, the length of time allowed for parking is probably too short to accomplish the purpose in mind and leads to worry about apprehension and fine. If no place is available at nearby curbs, either because all spaces have been taken or because parking is legally prohibited, search is initiated for a free space at some other less convenient curb which, when found, is too far away. Looking then for a stall in some parking lot or garage, one usually has difficulty in finding such a place really convenient to his purpose. When such a place is found, he may feel that the fee is too high, or that the attendants are too rough either on his car or on his finer sensibilities. Next time he vows he will take his business some other place where he can park conveniently and without worry, fear, and frustration.

Routes and Terminals

From a broader and longer range viewpoint, the parking aspect of highway traffic seemingly grows worse as the years go by. While significant developments aimed towards the improvement of routes for auto travel are being planned and carried out, little or nothing seems to be accomplished which will better parking conditions in the hearts of American cities. On the one hand, official agencies of federal, state and city governments are charged with the job of building and maintaining better routes for highway travel, and considerable sums of money are appropriated each year for such purposes. But on the other hand, nearly all official action which has been taken in parking matters has dealt primarily with more and more stringent regulation and prohibition of parking at the curbs. In a few rare exceptions in smaller towns, local government officials have not only exercised *restrictive* measures regulating the use of curb space for parking but also *have adopted creative measures whereby off-street parking space has been provided.*

The public responsibility for providing routes for highway travel and the private responsibility to provide terminal space for highway vehicles is a policy which has long been accepted. While street space is employed for parking purposes, such parking must and has given way to demands for movement.

The continuous movement of vehicles into and through the central district, however, does place a high demand on reserving street space for movement. Throughout the business day from 50 to 60% and during the rush hours from 60 to 90% of the vehicles moving in the central business district are merely passing through the district, and these drivers are not looking for a place to park. The demand for movement takes priority over demand for parking, and with increased traffic flow, it follows that more and more stringent curb parking regulations must be adopted.

Yet it must be recognized that movement alone can never accomplish the ends of transportation. Terminal space is as fundamental as is route space. In spite of the volume of moving traffic found in the central districts of our cities during the working day, less than 10% of the highway vehicles found at any *instant* are in motion and 90% are parked either at the curb or in some off-street parking space.

The demand for parking facility at any *instant* of the working day, therefore, involves far more drivers than are concerned with route facility alone.

Since every automobile that is in use has to be parked when it is not in the actual business of moving people, a measure of the over-all parking demand is reflected in motor vehicle registration. Today there are over forty million motor vehicles in operation in the United States. This is twice the number we had in 1925 and four times the number we had when we were coming out of World War I in 1920. Traffic flow is now 1/5 greater than it was just before we entered World War II. As a matter of fact, there are over four hundred billion vehicle miles of motor vehicle travel generated each year and studies show that about ½ of this travel arises in urban areas. Motor vehicle use has become so completely a part of the American way of life that it is now estimated that we will spend approximately 30 billion dollars annually or ⅛ of our total national income on automotive transportation. One person out of seven employed persons is directly or indirectly engaged in the provision of highway transportation. Approximately 80 cents out of the consumer transportation dollar is spent on automobile purchase and operation, while it is noteworthy that automobile costs rank fourth in total consumer expenditures following food, housing, and clothing.

It is clear that automobile use is still in its ascendancy and if full use of the motor vehicle is to be enjoyed, developments must not only be made in street and highway route improvements but also with parking and loading facilities properly located and designed to accommodate the terminal business of motor vehicle use.

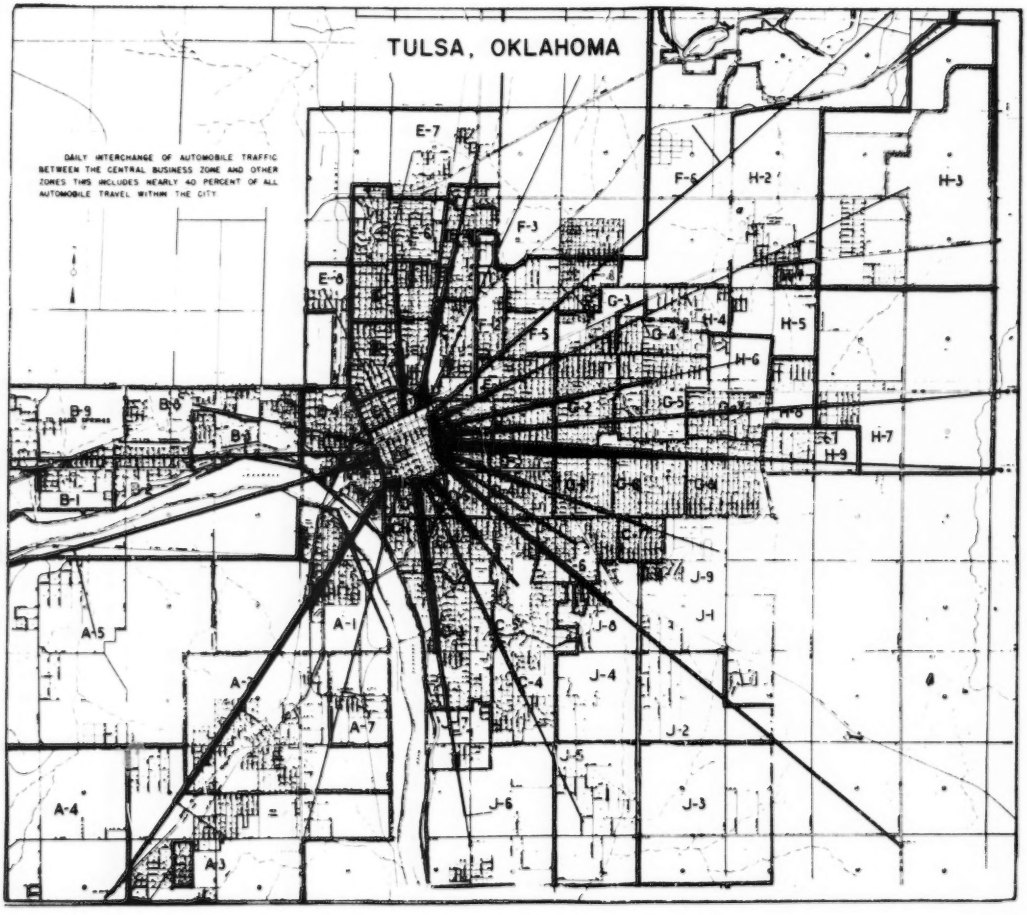
The Automobile and Retail Trade

Because of improvements which have been made in developing the networks of hard surfaced routes and because of the speed of movement provided by the automobile, the individual can now travel 25 or 30 miles in less time than he could travel 4 or 5 miles by horse and buggy. These factors have accordingly increased the potential trading radius of a given urban center. At uniform densities of population it follows the total number of potential customers to any trading center increases as the square of the trading radius.

Again, because of the increased over-lapping of trading areas of the diverse trading centers, due to increased trading radius, there exists an increased competition for the auto trade from such overlapping areas. Towns are in direct competition with each other for retail business.

The potential purchasing power of these vehicle users, however, may be driven away from one trading center to another, for the individual who finds it not only irritating to drive downtown but is also frustrated in an attempt to park his vehicle while downtown, soon learns that he can travel over the road network to other locations to satisfy his need for services and goods. Thus it is seen that cities and towns are in direct competition, one with the other, for the customer purchases that are represented by the automobile owners. Even within the same metropolitan area, those sections which are more accessible and provide more satisfactory parking space have a distinct advantage in attracting trade to their places of business. It seems clear that in the future those business districts which provide facilities to accommodate more and more motor vehicles will be in the advantageous position to serve more and more of the public.

Still further, when we look at merchandising processes in this automobile age we find that an increasing amount of customer goods are standardized products nationally advertised and sometimes even nationally priced. It makes little difference to the consumer of these goods at what point he procures them. Naturally that point which is most conveniently accessible to him will have the advantage in gaining his trade. There are a declining number of the basic commodities which require comparison both as to quality and cost by the consumer. Accordingly, with such standardized merchandise readily available for distribution, there is always the ready enterpeneur to serve the public at whatever point in the confluence of transportation he can find the opportunity to render this retail service. This is dramatized by the erection of new shopping centers near new housing developments and nearby major traffic interchanges,



Graphic study of traffic interchange between the central business district and the outlying areas of Tulsa, Oklahoma. Factual studies such as this help provide the information necessary for developing the location, capacity, and design of parking facilities.

where people, cars, and space are available.

Parking and Land Value

Since accessibility to population is of such fundamental importance in serving the public, it is evident that land values are also affected by inadequate traffic and parking facilities. Unless the points of highest land value in cities are made more accessible and provide convenient parking space at prices satisfactory to the motoring public, it can only be expected that there will be a shrinkage in their real estate values. Indeed, a study of assessed valuations in hearts of business districts shows that central business districts are decreasing in value at a more rapid rate than other sections of the city. Yet as the record stands today, only a very small percent (less than 5% of the total area in cities) contributes the largest percent (in excess of 50%) of land value and accordingly tax revenues.

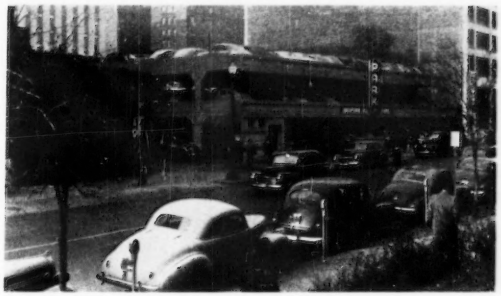
From every aspect we are driven to the conclusion that our parking and traffic problems are on the ascendency, and unless improvement is forthcoming very soon, the entire character, at least of the larger cities, will be changed so that the central business district will become merely one of many focal points in the traffic stream instead of the single major focal point. Property values therein will thereby suffer a considerable shrinkage in capital value.

Motivating Factors

From the conditions described above as developing today, it follows that there are three factors which must be reckoned with if parking improvements are to be made in the hearts of our cities. In the first place, there is that group which is represented by the individual automobile owner or driver. In the second place there is that element which involves the legislative and administrative branches of government, and in the third place there is the land owner and his operator whose capital values are involved.

It has already been suggested that due to the network of streets in the ordinary city, the individual who cannot quickly and rapidly achieve his purpose in the heart of cities and having in his hands a flexible means of transportation represented by the automobile, will seek other areas to satisfy his wants. As an individual he is rather powerless to create any parking space for himself in the central business district, and while he is able to buy parking space at a price, it may be at a price which is too high for his purse. For example, if an automobile operator travels five miles to the business district he will have spent approximately twenty cents in movement (at an operating cost of 4 cents a mile). If after arriving at the central business district he has to pay thirty-five cents for a place to park, he finds that he is paying more for parking than he is for movement and may consider it unreasonable. Yet he has no other choice but to pay the price or go elsewhere. Still in most cities the business of creating parking space off-street is considered as a business venture for a gain and not as an ancillary facility to other land use.

Again, when the parking program is reviewed from the standpoint of individual motivation for its improvement, there it little or no probability that there could be effectively organized group action by all individual motorists who may wish to seek improvement of parking conditions in any central district. It would be an almost impossible task to create such an organization not only because of the number of people involved but because of the changing and



Illustrative example of modern open-deck parking facility. Note the already strictly regulated curb parking in the foreground. As demand for movement grows even this type of curb parking can no longer be tolerated.

varied demands among individuals and the diverse political jurisdictions from which they come. Experience shows, however, that the individual motorist is willing to contribute something to the expense of providing a satisfactory parking space in the central district. The exact price, of course, varies with the size of the town, the income level of the community at a particular time and the comparative costs entailed in areas which are in competition one with the other.

From the viewpoint of the administrative and legislative branches of government, it is clear that today the legislatures and police have passed regulations which are nearly unenforcable. Since movement alone does not achieve the ends of transportation, without proper terminal facilities there results an utter frustration. To ask a police officer to enforce a "no parking" rule in the heart of the city is asking an almost impossible achievement, and even when pressure is put on, the curbs still remain full of parked automobiles, violators are not apprehended or their cases are dismissed in the police court.

Thus the administrative branches of government cannot be expected to solve the parking problem at curbs. It may be taken as axiomatic that the curbs will never satisfy the parking demands of transportation in central business districts. City administrators, while frequently requested to do so, cannot be expected to lead the city out of the parking wilderness. To accomplish this would require appropriation of funds and the passage of laws which at once becomes a legislative matter.

When the parking problem is viewed from the legislative angle, it is clear that the relief of parking does not make very good politics. Each individual councilman or legislator is confronted with more immediate problems from his own wards or areas of the city, and parking in the central city, must, therefore, assume a place of secondary importance in his political platform.

City legislators, moreover, ordinarily do not have any monetary interest in the land values of the central business district properties, and while they are interested in maintaining stabilized land values and thereby a stabilized basis of tax revenues, such objectives are not easily translated to the average voter at the following election. It follows, therefore, that the city legislator, while he may be clearly willing and anxious to improve parking conditions in a central city, of political necessity must place himself in the position of *reflecting a demand either of the central city or of his own voter to do so.* Usually the voters in the ward have

problems of more immediate and direct personal concern than those which arise from inadequate parking spaces in the downtown district.

There is a dependence placed on the legislator to reflect the desires of his community in improving parking matters in his jurisdiction. In this connection it seems clear that the legislator may be looked to in matters pertaining to factual study and analysis of parking demand and supply, the acquisition and control of land for parking purposes, the adoption of zoning and building laws which will enforce creation of parking space, and in larger cities perhaps the creation of parking authority and assignment of administrative duties involved therewith.

In the final analysis, however, the average legislator must have a demand registered with him. He will usually be found willing and anxious to respond to the wishes of his voters and the business interests of the central city. He cannot be expected, however, to lead the way, to propose methods and ways of achieving improved parking conditions especially in those cities where an important part of the population moves by common carriers as in buses and street cars.

The Land Owner and Operator

Attention is now directed to the landowner and operator of land in the central business district. It seems that if they are to continue their capital values, they must maintain a high degree of accessibility as well as satisfactory parking arrangements. Just how much parking they should provide and at what price is a matter of business judgment. Again, the amount of capital they can place in parking facilities and the amount of capitalization which can be provided by charging the individual automobile driver is a matter of business acumen which must be made in the light of the severity of the competition from other business sections or other cities. The blue chips that are placed in chance are, in the final analysis, the chips of the land owner and operator in the central business district where parking is a problem.

Ordinarily no individual land owner or operator, however, can do much about the parking problem on his own initiative and effort, for if he does so he will also be providing parking space for his adjacent competitors. But there exists a community of land owner and operator interest in central sections which may be organized for the common good of that particular group. Such an organization, in turn, will form a springboard for action by government authority, which action will lead to the creation of facilities that will attract the purchasing power of the individual to the central city.

Formation of Policy

It is seen from the foregoing discussion that there is a lack of aggressive policy looking toward relief of present parking conditions in central cities. To allow this policy to continue seems an utter waste of community resources. Clearly what is needed, in each community is the creation of some body so constituted that it will objectively weigh interests, rights and responsibilities of each of the three motivating factors to the end that it will achieve a maximum degree of satisfaction to all. This job, of course, calls for leadership which properly should grow out of that community of interests which represents the businessman of the central city, for it is his capital values that are at stake. The legislatures of twenty-four states have already passed statutory laws authorizing cities to provide or foster the provision of parking facilities but the policy which is to be pursued in each city is a problem for the city alone to decide.

There should be created in each area where parking problems exist a parking agency properly constituted for that area which will have powers and duties of planning, financing, land acquisition, construction, maintenance, operation and other functions necessary to the creation of satisfactory parking conditions. Such an agency may be a unit of government or of private interests, and this decision rests properly with the citizens of the particular area at point.

Engineering Studies Necessary

When leadership is emergent, one of the first jobs is to determine the location, capacity, design, costs and other matters of parking structures. In this regard it becomes essential to carry out traffic and parking studies employing traffic engineering skills and techniques. Thus it becomes necessary to study the origin and destination of parking demand to determine the current modes in transportation and the desires of persons reaching the central city. An illustrative analysis of the daily interchange of automobile traffic between the central business district and other outlying areas included nearly 40% of all automobile travel within the city of Tulsa, Oklahoma. From such factual studies there will be developed objective criteria which are fundamentally necessary in determining the location, capacity and design of parking facilities. Parking studies which have been carried out by official agencies in a number of American cities have developed some very interesting characteristics of the relative amount of parking space which is actually available in the central business districts. Attention is turned to Table I which shows that as the size of the city increases in population, the parking space per thousand population decreases markedly, so that the ratio of actual demand for parking space to the supply available in the central business district increases so that in cities of less than 25,000 there is demand for parking four automobiles in space only provided for three; whereas in the larger metropolitan centers there is evidence that five times as much parking space is required as is available.

TABLE I

Curb and Off-Street Spaces Available in Central Business Districts*

City Population Group (000's)	Parking Spaces Per 1000 Population			Ratio of Demand to Supply[1] In Core of District
	Curb	Off-Street	Total	
Less than 25	54	36	90	1.31
25-50	41	19	60	1.31
50-100	23	24	57	1.45
100-250	17	25	42	1.67
250-500	7	21	28	3.27
Over 500	3	9	12	4.67

[1]The core is that part of district where the stalls in each block are inadequate to meet the demand for parking. These are among highest land values.

*Source: Some Travel & Parking Habits Observed in Parking Studies, Mimeo. Burrage, R.H. and Hitchcock, S.T., Public Roads Administration.

(See PARKING PROBLEMS, Page 19)

Driveway Control in Richmond, Virginia

By Marshall B. McReynolds
Traffic Planning Assistant

and

John T. Hanna (Jr. Mem., ITE)
Associate Traffic Engineer

THE proper method of providing curb-cuts and driveways in an urban area is nearly as important to the safe and expeditious movement of traffic as factually designed intersectional channelization. These two factors are closely related, since they both control speeds of vehicles, turning movements, conflict areas, points of access and egress, and accident potentials.

Prior to 1948, the control over driveway construction from a traffic engineering and safety standpoint was relatively unknown in Richmond. The result of this fact is widespread in this city of 250,000 population with its approximate 750 linear miles of improved streets, to the extent that during 1947, 15 per cent of all between-intersection collisions involved vehicles entering or egressing from private driveways. In one instance, driveways were constructed at a "Y" type intersection by removing the curb and curb return along the entire property line on both intersecting streets for a distance of 75-100 feet. This condition resulted in a wide area of conflict and caused confusion to motorists and pedestrians. Motorists were utilizing private property and the normal sidewalk area as a thoroughfare, thereby creating additional serious accident potentials. The removal of the curb return did not permit the installation of any traffic control treatment (signals, signs, or markers), which would have been dangerously exposed to moving traffic. To rectify this unsafe condition, expensive channelization treatment had to be installed at the expense of the public. On many of the major thoroughfares improperly designed driveways to parking lots or business establishments via property line driveways have been the source of major congestion and considerable public contention.

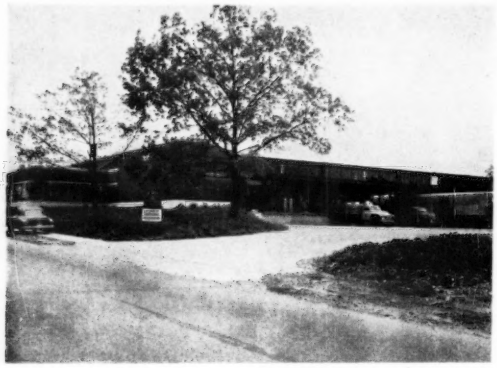
An example of an excessive number of driveways which have resulted in 90 degree parking on the oppesite side of the street.

With the activation of the Bureau of Traffic Engineering in the Department of Public Safety in July 1948, this Bureau adopted a driveway policy as a means of curtailing repetition of these existing undesirable traffic conditions which were created by the misuse of access points to and from our city streets. In conformity with the newly adopted City Charter, all applications for driveways were channeled through this office for appropriate traffic engineering investigations prior to the issuance of the construction permit by the Department of Public Works.

Subsequently, questionnaires were sent to all cities in the Richmond population group requesting data relative to their policies on driveway control. Very little helpful information was received from other cities which could be adopted to local conditions. The next step then was to set up our own specifications. All available pertinent data were obtained from literature, architects, builders and traffic consultants. Through the cooperation of the Department of Public Works, a driveway policy was established only after informing all local architects, builders, contractors, oil companies and the most effective types of business operators of the proposed policy. Comments and recommendations were solicited from these men. Their answers were summarized and adjusted to permit the formulation of a policy which would be acceptable to the majority.

A few of the basic factors set up as a guide were as follows:

1. The maximum width of any driveway should be 35 feet. Previous studies indicated that this width driveway would accommodate vehicles of the maximum length authorized by the Virginia State Motor Code at the most desirable speeds.
2. Curb lengths should be provided in multiples of 20 feet between driveways. This stipulation was provided to permit passenger vehicles to park at the curb between driveways without protruding into the driveways and thereby restricting their usage.
3. Driveways to public off-street parking facilities were set up as follows:
   A. Entrance only—18 feet
   B. Exit only—16 feet
   C. Combined entrance and exit—24 feet
4. Driveways which are granted to serve as an entrance only or an exit only are appropriately signed by and at the expense of the property owner.
5. Whenever feasible, driveways should be constructed on the minor streets.



Well defined driveway with a minimum area of conflict.

6. When granting driveways to provide access to large off-street parking facilities located on property abutting intersecting streets, the entrances only should be established on the major street and combined entrances and exits on the minor street. (This stipulation was based on actual experience wherein vehicles could not egress safely in a reasonable period of time on a major arterial thoroughfare.)
7. Driveways near intersections should begin a minimum distance of 5 feet from the intersecting property line or curb return, whichever is the greatest. This stipulation provides an area on the sidewalk for the future installation of traffic control signs, signals, street lights, fire alarms, and fire hydrants.
8. Driveways to parking facilities should be located a minimum distance of 25 feet from street intersection property lines. Mid-block construction is encouraged.
9. Residential driveways were established to be a uniform width of 12 feet. Wherever suitable abutting alleys have been provided at public expense by the city, their use as access to residential property is encouraged.
10. Where driveways are granted on residential streets, the property owner is requested to provide an off-street cul-de-sac to permit vehicles to egress forward into the street from the driveways.

Through this driveway control policy, the Bureau of Traffic has been consulted frequently in the design of parking lots, garages, truck terminals, service stations, and other facilities which necessitate access from the street.

Each application for new construction affecting traffic operation to any degree is channeled through this office for recommendations relative to the construction of driveways. Since Richmond does not have a building code which requires the provision of off-street loading and off-street parking areas, a large number of business operators have been indirectly induced to provide off-street parking at their establishments through the control of driveways. Merchants who intend to use a loading door and platform at the sidewalk line are required to design the curb-cut offset from the loading door. This design requires trucks to back in at a 45 degree angle rather than the customary 90 degree angle.

In instances where the design of a facility will not permit the construction of driveways to conform to the accepted policy, a joint conference is held by this Bureau, the builder and/or the architect to adjust the internal arrangement of the facility to permit construction of standard approved driveways.

In many cases the re-arrangement tends to increase the operational efficiency of the facility in conjunction with traffic efficiency. More specifically, through this arrangement the reservoir capacity of a multistoried parking structure was increased 150 per cent over original plans, thereby eliminating the necessity of utilizing the public street for vehicle storage.

Pursuant to the establishment of the Traffic Engineering Bureau, a survey was conducted of all existing driveways and curb-cuts in the city for evaluation purposes. This survey indicated that there were approximately 20,000 existing driveways. At 50 per cent or more of them, one to two "No Parking In Driveway" signs had already been installed. The installation of such signs in the vicinity of driveways is a non-standard procedure. The "Manual on Uniform Traffic Control Devices" definitely recommends against the installation of such signs. Further, the State and local traffic codes both prohibit the parking of a vehicle, whether attended or unattended, within a driveway. Providing that the previously installed driveway signs were standardized and were permitted to remain, additional signs would have been necessary at many of the remaining unsigned driveways, since signs prohibiting parking only at some driveways and not at others would have given motorists the erroneous conception that parking in the non-signed driveways was permissible. This condition generally created bad public relations and put an unjustifiable burden on the taxpayer required by the expenditure of installing these signs. To alleviate this condition, an educational campaign was launched to inform the public of the law prohibiting parking in driveways. Notice was given that all such "No Parking" signs would be removed and not replaced. Immediately thereafter, the City Council increased the fine for parking in driveways from $1 to $5. Prior to the removal of driveway "No Parking" signs, this Bureau received 10 to 15 requests a week for such signs. Eventually, education and enforcement took over and at this writing a parking in driveway complaint is rarely received.

Channelizing treatment to reduce accident and congestion potentials.

Accident Location File on a Ten-Year Basis

By Edmund R. Ricker (Mem., ITE)*
City Traffic Engineer, New Haven, Connecticut

THE factor of chance so often affects the incident of motor vehicle accidents that short-term studies do not accurately reflect the true importance of physical conditions or traffic controls. Accident experience is customarily used as a measure of "before" and "after" conditions. Yet, the selection of the period for study will many times predetermine the results. When this fact is recognized it accounts for the apologies which are usually appended to short-term studies, and for a feeling of uncertainty when accident records alone are used as a basis for action, or inaction.

An extreme example of variations in accident experience is found in New Haven at a signalized intersection on U. S. No. 1, which, in 1947, recorded two accidents; in 1948, eight accidents, including one fatal; and in 1949, one accident. During this three-year period, there were no changes in physical conditions and traffic volumes did not vary from normal. Yet, if one-year accident records were used as an index, this intersection was either at the top of the "Worst Corner List," or just another intersection. What then, if a physical change *had* been made at the end of 1948, would not the record show a marked improvement in "before" and "after" studies?

Such incidents, combined with other factors as the time involved in consulting a multiplicity of files in order to make one accident study, led to the establishment of a long-term accident location file. The resulting file presents a complete and up-to-the-minute accident record for every intersection in the city.

Material Needed

In deciding to create a long-term file, a careful study was made to determine exactly what material was needed to make it complete, what uses would be made of the data assembled, and what methods of filing would be most effective and least time-consuming.

Original reports of major accidents investigated by the New Haven Police Department are prepared on 6″ by 8″ cards and are filed by location on an annual basis. (A major accident is defined as one involving personal injury or property damage over $25.00.) Detailed reports, statements of operators and witnesses, and collision diagrams are filed in large manila envelopes. As each report is received, it is given a serial number and is entered on a monthly record sheet. The serial numbers are assigned beginning with "one" each year, and provide ready cross-reference between the record sheet, the location file, and the envelopes, which are filed consecutively. Current files include accident cards for two preceding years and envelopes for one preceding year. The information on the accident cards from 1947 on was thus available in good order for transfer to the long-term file.

The direct connection between traffic regulations and accidents made it seem advisable to record applicable regulations. The fact that all intersections would be included made it possible to utilize the file as a complete index of regulations as well. Previously, each type of regulation had been filed separately on 3″ by 5″ cards, so that several drawers were needed, and each one had to be searched to find a record for a particular location. Since the official booklet of Traffic Regulations for the City of New Haven was obsolete, its revision was included in the project of preparing the material for the file.

Obviously, some traffic regulations, such as the prohibition of all-night parking, are too general for the accident file. Others, such as bus stops and taxi stands, were not included since they were in the process of revision, but will be added later. The regulations of direct interest and which were tabulated for the file are: traffic signals, stop signs, one-way streets, channelization, and parking limits.

Like many other cities, New Haven has many intersections at which more than two streets intersect, either as five or six-point junctions, offset intersections, or simply because street names differ on two sections which meet at the intersection. To prevent duplication of locations where accidents might be identified with any pair of the intersecting streets, a list was made of all multiple intersections, and all accident cards referring to these locations were re-indexed and filed under the first two alphabetical street names.

Visible File Chosen

In view of the many uses anticipated for the file, and the large amount of data to be posted, a visible file was chosen as the most suitable. A rough estimate was made to determine the number of file pockets needed, based on the fact that there are approximately 690 streets and 1600 intersections in the city and 1200 accidents occurring annually. It was decided that a capacity of 1200 cards was needed, and the largest available file, with 1224 pockets, was ordered.

Several mock-up cards were drawn and utilized to enter the information for specific intersections. Careful analysis of the information available on the accident records was made to determine that which was most needed for engineering studies and how best it could be arranged in the new file. A fold-over type card 8″ by 9″ was selected. The normal alphabetical order for a location file was utilized, except that intersections were designated, rather than cross

*See *New Appointments*

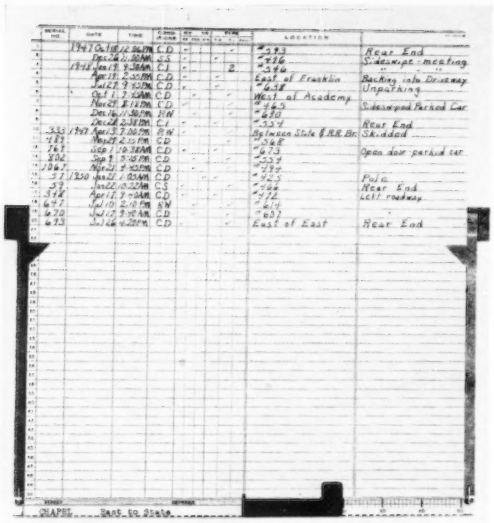


Fig. 1

The following regulations are typed on the reverse side of the card: PARKING: East to Olive: Both Sides: Two Hours. Olive to State: Both Sides; 30 Minutes; No Parking 4:30-6:00 P.M.

streets. White cards were used for the midblock locations and buff cards for the intersections to facilitate ready reach of the file.

Midblock Cards

On the lower edge of the card, which is exposed in the file, the street name is typed at the left in capital letters, and the limiting streets at each end shown in small letters under the word "between" in the same order as the street numbers increase. Where streets have a large number of midblock accidents, either because of physical length or high incidence of accidents, they are divided into convenient sections which average about five accidents per year and a separate card prepared for each section. The card for one section of Chapel Street is shown in Fig. 1. A scale is printed on the right side of the exposed edge. A moving signal of transparent orange-colored plastic is fitted to move along this scale to show the current total of midblock accidents on the street.

The face of the card when opened is nine inches long, providing space for recording fifty accidents. Thirteen columns are headed as follows:

1. Index numbers, printed 1 to 50, identify the accidents on the card and facilitate setting the moving signal.
2. Serial numbers, to be entered corresponding to the Police Department accident card numbers. (On the sample card it will be noted that these numbers are shown from 1949, when the serial number system was instituted.)
3. To date, showing the year, month, and day of the month. The year is shown only once, opposite the first accident of that year.
4. The time of day.
5. Weather and pavement conditions, in two letters, abbereviated as follows:
   C—clear or cloudy; R—rain; S—snow; F—fog
   D—dry; W—wet; S—snowy; I—ice.
6. 7. 8. Classification of accident as motor vehicle, pedestrian, or other, shown by a check mark.
9. 10. 11. Type of accident, whether property damage, personal injury, or fatal, shown by a check mark. More than one personal injury or fatality is shown by the number instead of a check.
12. Location, shown by house number or identifying phrase.
13. Remarks, including description of "other" accidents.

The reverse side of the folded card is ruled horizontally and is used to show one-way regulations and parking limits. The direction and extent of one-way regulation is shown, with the dates of passage and installation. Parking limits are divided into sections limited by the points where parking rules change. No dates are included for parking regulations.

Intersection Cards

The names of the intersecting streets are typed at the left edge in capital letters, with any additional streets at multiple intersections shown in small letters. Thus, the arrangement of cards in the file is shown below, reading from the front of the file towards the back:

Street	Between	
BOULEVARD	Sea to Derby	(White card)
BOULEVARD	Derby to Crescent	(White card—street divided into two sections because more than 20 accidents have occurred in three years)
BOULEVARD-CHAPEL		(Buff card)
BOULEVARD-COLUMBUS-Congress-Davenport		(Buff card—multiple intersection)

A recording scale is printed similar to that on the street cards and a red moving signal is used to show the current total of accidents. Small signals of green and orange plastic are used to indicate traffic lights or stop signs, respectively, and corresponding words are printed near the center of the exposed edge. The card for a typical intersection is shown in Fig. 2.

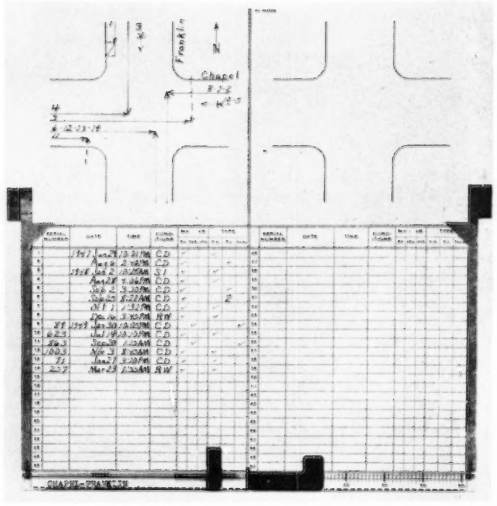


Fig. 2

The following regulations are typed on the reverse side of the card: STOP on Franklin: Passed: 6-7-48; Installed: 9-16-48; Removed: 3-30-50. SIGNAL Passed: 12-5-49; Permit #383, 3-23-50; Installed: 3-30-50. ONE-WAY on Franklin northerly; Passed: 6-7-48; Installed: 9-16-48.

The face of the card is divided vertically to allow space for recording twenty-five accidents on each half.

The section below the fold has columns identical with the first eleven on the street card. The section above the fold is used for a collision diagram. Seventy-five per cent of the cards were printed with a regular shaped four-way intersection, and the remainder left blank for drawing sketches of irregular intersections. The collision diagram is prepared with standard symbols, except that it is simplified by identifying each accident with a number corresponding to the index number on the lower half of the card. Similar accidents are thus identified by a series of numbers on a single set of arrows. Street names and a north arrow properly orient the sketch.

On the reverse side of the fold-over section, a complete history of traffic regulations at that intersection is typed, and becomes the official record. The passage and installation dates of stop signs and traffic signals are shown, with any pertinent changes. Traffic signals approved by the Connecticut Traffic Commission also show the permit number and date of approval. The installation dates of one-way streets, channelization, or other changes are also noted.

Use of Long-term File

The new file was put into use early this year, with all accidents being entered for 1947, 1948, and 1949. Current accidents are posted at the end of each month. Cards were also prepared for intersections which have been free from accidents since 1947 but which have control regulations now in force.

Specific uses which have amply justified the creation of this file include before-and-after studies on street lighting, justification of street paving and widening improvements, and measurement of and the effectiveness of new pedestrian WALK signals. The file is of considerable value in public relations, since it shows that every intersection is under continued suveillance and indicates at a glance the relative importance of various locations.

To date, the basic layout of the cards has proved very satisfactory. Ample space is provided on the cards for at least a 10-year record. The original filing cabinet is nearly full and it will shortly be necessary to add another with a smaller number of drawers to cover additional intersections at which accidents occur. As succeeding years' accident experience are added, there will be more and more valuable information collected which will permit a close check on the effectiveness of regulations and other accident-prevention measures. As far as possible, the random pattern of accidents will be balanced out, and a sound basis provided for further accident studies.

Reference Notes

Angle vs. Parallel Parking

By George J. Fisher (Mem., ITE)
Traffic Engineer, Wichita, Kansas

Main Street in the City of Wichita, Kansas, is 65 feet wide and in the section from Lewis Street to Ninth Street, a distance of approximately 1½ miles, angle parking existed for a long time, causing a great deal of congestion and many accidents. When angle parking existed, the average speed of travel for this distance was 11.8 miles per hour during the peak period of the day and the street was carrying an average of 8,800 vehicles from 7:00 A.M. to 7:00 P.M.

After parallel parking was established around April 1, 1950, the average speed of travel increased to 16.1 miles per hour and the volume of traffic for the same period of time increased to an average of 9,500 vehicles. The peak hour traffic on Main Street was 900 vehicles before parallel parking was established and the street is now carrying an average of 1,200 vehicles during this peak hour, which is from 5:00 P.M. to 6:00 P.M.

From January 1, 1950, to April 1, 1950, three mid-block accidents occurred on Main Street, and for the three months after April 1, 1950, two accidents have occurred. On West Douglas Avenue, where the angle parking was also changed to parallel parking, the accident experience has shown a greater improvement. For the three months previous to the elimination of angle parking, five mid-block

(See REFERENCE NOTES, Page 21)

Looking north on Main from Douglas "BEFORE" angle parking was removed.

Against The Adoption of Polarized Headlights At This Time

By Engineering Liaison Committee
of the Automobile Manufacturers Association

The April and July issues of "Traffic Engineering" magazine contain articles written by E. H. Land and L. W. Chubb Jr., entitled "Polarized Light for Auto Headlights." The second article makes reference to the tests of polarized headlights conducted by the Automobile Manufacturers Association at the request of the American Association of Motor Vehicle Administration. To further acquaint our readers with the pros and cons of polarized headlighting, "Traffic Engineering" herewith publishes the first of two articles covering the report of the Engineering Liaison Committee of the AMA on the subject. We are indebted to Mr. W. F. Sherman, Manager of the Engineering and Technical Department of the AMA, for supplying a copy of this report, which was presented before the 15th Annual Convention of the AAMVA on November 10, 1947.

Part I

A POLARIZED headlighting system includes two principal components, polarized headlamps which emit polarized light, and a viewer. The Polarized light looks like ordinary light to the unaided eye. The viewer appears in ordinary light to be a transparent sheet which somewhat reduces the amount of light that passes through it. This viewer, properly mounted with respect to the polarized light can reduce the light from a powerful polarized lamp to a glare free level. All cars can have identical polarized lamps and viewers, and have the viewers on any car prevent glare from any opposing car's polarized lamps. With his viewer in use any driver can see the illumination from his own headlamps practically without interference from opposing polarized headlamps. When the opposing car is close, he can see the roadway beyond the opposing car's polarized headlamps.

For reasons explained later, non-polarized city lamps are used, and the electrical supply system must be redesigned. The most apparent change is the use of four headlamps as shown in Fig. 1. Fig. 2 shows one form of viewer in use.

First Steps

The Committee has followed the procedure which would be used by any individual manufacturer in deciding the merits of a new feature. The industry has had years of experience with such problems.

Two questions are always asked about proposed new features. Is a design available which works as claimed? Can such a design be expected to stand up in service, using available materials and production methods? Road demonstrations showed that drivers of meeting car equipped with polarized systems could obtain road vision without glare. Exposure tests have indicated that materials now available will probably show the required life in automobile use. The endurance tests of the complete system which would be necessary before release for production have not yet been run. Such tests should be run on the final designs each manufacturer would develop for his use. They are not justified until it has become very certain that the design will be used if the endurance test results are satisfactory.

Provision for Competitive Supply

The Committee policy has been in this instance as with the Sealed Beam, to cooperate in producing the best design, while ensuring that competition in production will remain effective. The Polaroid Corporation was found to hold patents on the only usable materials of which we are yet informed. To insure that materials produced on a competitive basis would be available for all, an agreement was negotiated between the Automobile Manufacturers Association and the Polaroid Corporation under which any motor car manufacturer may secure a license to make, have made, use and sell materials and equipment required for automobile lighting. All manufacturers are on the same basis. Royalties for service parts so'd the public are the same as for original equipment sold the manufacturer. The Committee has done all it can to remove the usual objections to patented devices which must be universally used to be fully effective.

Full Scale Tests

Experience has shown the automobile industry that a new component can be evaluated only after properly designed samples are operated as parts of complete vehicles. The Committee has carried out such studies, operating on an industry basis. Almost all car manufacturers have equipped vehicles with complete polarized headlighting equipment developed under Committee supervision. This

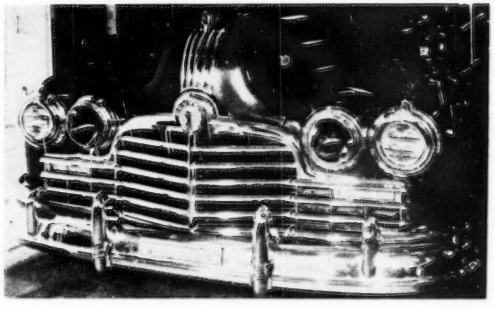


Fig. 1
Polaroid installation on Pontiac.

equipment has been designed with the aid of the Headlighting Technical Committee which includes the industry's leading electrical engineers, working in cooperation with the Polaroid Corporation, the General Electric Co. Lamp Division, and the engineers of the automotive electrical equipment manufacturers. This sample equipment could be made the basis of commercial design. The Polaroid Corporation has agreed that the system is adequate to show the merits of polarized headlighting.

Ground Rules for Design

Two basic objectives were set up to govern design:

1—Road seeing with the full polarized equipment in use must be as safe as with Sealed Beam upper.

2—Glare from the unpolarized lights used for city driving must not exceed Sealed Beam city beam limits.

To meet the first objective it was necessary to obtain the same visibility of dark objects when the viewer is in use, as is provided by the Sealed Beam upper beam. Light colored objects are not as visible as with Sealed Beam uppers, but are visible at substantially greater distances than are the dark objects. A few of the engineering facts must be discussed to explain this situation.

Basic Conditions Affecting Design of the Polarized Lamps

The headlamp light is "polarized" by being sent through a polarizing sheet. This sheet transmits practically all the light having a certain relation to a plane parallel to the beam, and absorbs almost all of the light having another relation to this same plane. This reference plane is called the plane of polarization. If another identical polarizing sheet is placed parallel to the first sheet most of the polarized light will be transmitted through it when the two planes of polarization are parallel. If the second sheet is rotated about an axis parallel to the light beam, the second sheet stops more and more light as the rotation increases up to 90°, at which point practically none of the polarized light passes the second sheet. This second sheet acts like a viewer with respect to the polarized light. If the lamps and viewers on all cars have their planes of polarization at 45° to the vertical, reading clockwise, when two such cars face each other, their planes of polarization will be found to be at 90°, and the viewers on either can stop the polarized light from the other. Acting on advice from the Polaroid Corporation, a modified arrangement is used on the Committee cars which is discussed in an appendix.

Polarizing the light by passing it through the sheet as fixed to the headlamps causes the loss of about 60% of the light under the best conditions. The viewer absorbs about 25% of the light polarized in the same plane as the viewer. Therefore, if a driver behind a viewer having the same plane of polarization as the headlamps is to see an object as well with polarized light as he could with ordinary light with a viewer, over three times as much light must be provided before polarizing it. Since dark colored objects do not depolarize very much, a little over a three times increase in lamp watts is required for equal safety. To insist on equal seeing of light colored objects with polarized light would demand over six times as much wattage at the lamp, since the light colored objects depolarize nearly all of the polarized light striking them, and the viewer absorbs over 60% of the depolarized light reaching it.

This difference in depolarizing causes a change in contrast for objects seen with polarized light as compared to ordinary light.

Fig. 2
Polaroid viewer in position for use.

A single filament lamp permits a chosen beam pattern and brightness to be obtained with less filament watts than would be required in a two filament lamp.

Light above the horizontal does not cause glare to the person behind a viewer, and the polarized headlamps use such light to provide better road visibility than is now permitted for Sealed Beam upper beams.

The combined effect of all of the above factors is that 125 watts are needed in the polarized lamps to provide the same safe seeing now obtained with 45 watts in the Sealed Beam upper beam.

The Polarized Headlamp

The 125 watt polarized headlamps use the Sealed Beam reflector and could be installed in a Sealed Beam housing. Heavier electric terminals are required. A flat front lens is used to permit the installation of the polarizing sandwich which is cemented to the flat lens. This sandwich consists of a sheet of plastic, next to the lens, then the thin polarizing sheet, and a front protecting cover glass.

These headlamp units require the same adjustments for aiming as for Sealed Beam so as to secure good illumination. Glare to a person behind a viewer cannot result from bad aim.

No provision has been made to adjust the angle of the plane of polarization. This may prove desirable, or even necessary to correct for changes caused by fender repairs.

Replacement of a complete unit restores the original lighting conditions, just as occurs with Sealed Beam.

The Viewer

The viewer is a new piece of equipment which the driver must learn to use properly. Many different designs are possible. The experimental cars are provided with polarized visors supported from the windshield frame for the persons in the front seat. Goggles can be available for rear seat passengers. It is necessary in service that the correct plane of polarization be maintained within a very few degrees. The surfaces must remain clean and smooth.

The viewer should be out of the line of sight during most day driving, but can be used to reduce brightness to 37% of the original on a bright day, and also eliminate a part of the polarized light reflected from road surfaces under some conditions of driving.

The viewer should not be used in city driving at night

since it absorbs over 60% of the light provided by street lighting.

Many drivers would wish to have the viewer out of the way on open country roads, and available for immediate use when a meeting car appears.

The mounting mechanism must permit swinging the viewer out of and into the line of sight without disturbing the plane of polarization.

City Lamps

A pair of city lamps is another added item.

These lamps must be designed and aimed so they will not glare pedestrians in cities. These pedestrians would not have viewers. Separate city lamps involve less total cost than would be required to increase the polarized lamps to the much greater size required with two filament lamps of the high watts used.

Sixty watts are now used in each unit in an effort to provide fair road illumination with a viewer in use. With the viewer a lower wattage would be sufficient to match Sealed Beam lower performance.

Five and three-quarter inch lamps are used. The present beam design has less light at and near the horizontal than Sealed Beam lowers.

These lamps must be aimed both to a horizontal and vertical cut-off line. This requires more skill and care than is needed in aiming the present Sealed Beam uppers by locating the center of the hot spot.

The Windshield

Windshields used with polarized lights must be inspected to eliminate faults which are not perceptible in ordinary light. Strains in the plastic, whether due to manufacturing conditions, or to twisting of the glass in the frame, change polarized light passing through in such a way that the viewer permits more leakage.

Divergence from parallelism of the glass surfaces causes a shift of the ghost image always present with ordinary glass. In slanting windshields with polarized light these ghosts are much brighter, relative to the main image than is the case with ordinary light. The viewer does not stop the ghosts as well as it stops the light in the main image. Greater care in manufacture and inspection will be needed. The resulting increase in cost is still uncertain.

Electrical Supply

The great increase in electrical requirements for the headlamps makes it necessary to use a generator of about twice the present output in the polarized system. This generator is so large that there would be difficulty in providing space for it in some engine compartments. The electrical wiring must include much larger conductors. An electromagnetic relay is inserted between the headlamps and the current supply to reduce length of conductors. The overall result is a considerable increase in weight and cost, in fact a very large part of the total cost increase is in this part of the equipment. It is possible that use of the system by the general public would develop the need of other expensive changes, such as a larger battery.

Weight Increase

The removal of components useful only in a Sealed Beam System, and their replacement by new components for a complete polarized headlight system resulted in a net increase in weight of 26 lbs., for one of the smaller cars.

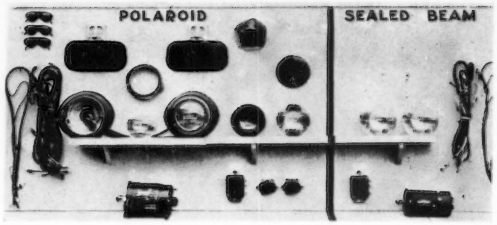


Fig. 3
Comparison of Polaroid and sealed beam equipment. Right of vertical line—sealed beam parts removed when polaroid is installed. Left of vertical line—polaroid parts added. One Polaroid Headlamp shown partly disassembled. One city lamp housing and unit complete, one partly disassembled.

This includes no allowance for any new styling. Fig. 3 shows the parts removed, and the new parts added in changing the headlighting on a low priced car from the Sealed Beam to the polarized system.

Effect on Cost

The cooperating manufacturers have made estimates of the increase in selling price which would be made necessary by the change from Sealed Beam to polarized headlighting. On the basis of cost of last summer the figures varied from $30.00 to $80.00 per car. On sales in a normal year this increase in unit price would represent a cost to the public of $100,000,000, or more.

Possible Method of Introduction

Possible methods of introducing polarized headlighting have been surveyed by the Headlighting Technical Committee. Four of these methods are outlined briefly, since the method of introduction used will control the results obtained during the introductory period.

Method I

It is assumed that all *new* cars are required to be equipped with polarized lights after some determined date, and that it would be permissible to install it on cars already in service. It is believed that there would be a negligible amount of conversion of old cars.

The industry is thoroughly familiar with this method of introducing new features. The cost of preparation for production would be at a minimum, and the effectiveness of training field personnel to handle the equipment would be better than under any more rapid program.

Four or five years would elapse before half the cars in use would carry the new equipment, and a much longer time before the last car with ordinary lights would be retired. *It would be necessary to develop adequate legislation and enforcement organization to deal with the mixed use of two lighting systems.*

Method II

It is assumed that all new cars will carry the polarized equipment after a certain date as in Method I. At this same date the compulsory conversion of equipment on old cars to the same standard as on new cars is to be started at a rate which will complete the job in a reasonable time, say two years.

This would have the advantage of shortening the time of complete change-over, thus reducing the sum total of difficulties with mixed use of equipment. There is no precedent for such compulsion applied to owners of cars already licensed. Some of the problems are discussed in the appendix.

Method III

New cars are to be treated as in Methods I and II. It is assumed that some substandard polarized light system is available which will be required to be installed on all old cars within a two year period. This substandard system is assumed to be usable in connection with the existing electrical supply system, to produce a tolerable result when meeting cars using polarized light, and thus to permit the maximum use of the polarized equipment on new cars. It would provide less effective lighting than the Committee's sample system, which means less effective seeing than with Sealed Beam for any drivers who used this proposed meeting beam as a driving beam.

The only advantage as compared to Method II would be reduced cost to owners of old cars. Approval of this method by administrators would set a precedent of approval of a system which would be below the standard which the Committee believes the minimum for safe seeing. The users would have to be trained to use a three beam system.

Method IV

The electrical systems and mechanical parts required for polarized headlighting would be installed on all new cars beginning on a certain date. Sealed Beam lamps would be installed and used until a large percentage of cars are equipped, after which the lamps will be changed from Sealed Beam to polarized, in a very short time.

The great advantage is that the period of mixed use of two headlighting systems could be reduced to almost any desired minimum. The main disadvantage is that the car owner would pay for something he would not get until some later date. There would be some problems in producing and handling the lamps required for the conversion.

Combinations of some of the features of one method could be made with another. More detailed discussion will be found in an appendix.

The Committee understands that many administrators consider it certain that no legislation compelling any conversion of old cars is possible. Legislation under which Method IV could be applied seems equally unlikely. Therefore the remainder of this report will discuss various questions on the assumption that Method I is the only method of introduction requiring serious consideration.

PARKING PROBLEMS . . .

(Continued from Page 10)

TABLE II

Length of Time Parked and Walking Distance*

Population Group (000's)	Per Cent Parked Less Than Thirty Minutes	Per Cent Parked Four Hours or More	Per Cent Walking Less Than 400 Feet	Per Cent Walking 500 Feet and Over
Less than 25	56	8	69	9
25-50	50	10	78	5
50-100	52	10	77	7
100-250	46	14	65	14
250-500	24	20	63	19
Over 500	28	25	46	30

*Source: Some Travel & Parking Habits Observed in Parking Studies, Mimeo. Burrage, R.H. and Hitchcock, S.T., Public Roads Administration

Again, these engineering studies have developed some rather interesting facts concerning the length of time parked and walking distances required in different sized cities. See Table II. The evidence shows that the automobile is used for short trips requiring a minimum of terminal time in the smaller cities but its use in larger cities is preponderantly toward longer terminal time. Thus in the smaller cities only 8% of the vehicles were found to park four or more hours while in the larger cities as much as 25% were found to require this duration of parking. Again, the table illustrates clearly the additional walking distances which are imposed in the larger cities. For example, in the smaller cities only 5 to 10% were required to walk over 500 feet from their parking space to ultimate destinations whereas in the larger cities this larger trip on foot was required by about a third of the parkers. Clearly, the increased severity of the problem in the larger cities is indicated by these data.

Method of Finance

One of the most difficult and knotty problems to solve in the creation of parking facilities is the method of financing which will be employed. There seems to be emerging three broad patterns of finance. In the larger cities it would appear that the entire cost of parking facilities will be borne by the automobile user through parking fees. Collection of these fees serves as security for the issuance of revenue bonds on a twenty or thirty year basis. Under these conditions a public authority is usually created as the administrative agency. On the other hand, in the very small towns where there does not exist a common carrier transportation system, there seems to be emerging a policy of making facilities in central areas. Thus a recent survey shows that 345 out of 875 cities have created off-street parking space as a public improvement. In some few instances these cities are charging a fee through the use of parking meters or other devices to retire the costs involved. In the third place, in the medium-sized city which enjoys a common carrier passenger system there is some evidence of the government and the benefitted properties sharing the cost and management of providing off-street parking space. In cases of this type the special benefit assessment play is employed with or without the charge of a fee for parking. Where private interests dominate, shares in a limited parking corporation are sold. Such corporations may obtain certain benefits from governmental action.

Conclusion

Parking is one of the foremost current problems in American cities. To allow parking matters to drift is a waste of community resources in that it destroys the utility of the individual automobile, it deteriorates land value of central business districts, and it assesses a higher tax burden on the small property owner. Genuine leadership is required by both government officials and business agents to bring together the forces of government, business and individual automobile owners into a well-balanced policy of procedure which will employ engineering studies in the location, capacity and design of off-street parking facilities and which will form financial plans which are best suited to the particular community.

Yale Scientific Magazine
December, 1949

Open Discussion

By Jerome D. Franklin (Assoc. Mem., ITE)
Traffic Engineer, Grand Rapids, Michigan

The Young Driver

FOR the past few years there has been considerable controversy with regard to our young drivers, particularly those in their later teens and early twenties. In fact, the influence of the statistics gathered has such bearing that many insurance companies at the present time have increased their premiums when it has been determined that the insured motor vehicle will be driven by someone below the age of twenty-five.

There can be no doubt that our young drivers of today are involved in many accidents, but it is the feeling of certain people in the traffic and accident field, particularly in those locations where accident reporting is relatively good, that teen-age drivers might not be involved in more than their proportionate share of accidents, considering their miles driven. Nevertheless, the campaign against our younger driver is carried on relentlessly and more determinedly by the parents of these drivers who, for the most part, were themselves the same younger driver in the 1920's.

Certainly, in many ways it is not possible to compare driving conditions in 1950 with those prevalent in the 1920's, but we do have certain facts within our grasp, both tangible and intangible. We know that the roads of 1950 are much better and that the vehicles of 1950 are much safer, at least from a mechanical standpoint; however, a counterbalance in favor of the 1920's is the fact that the vehicles were driven at a much slower rate and consequently from the proponents who argue that speed is our worst enemy, this fact alone should have affected the fatality statistics of twenty-five years ago. The above arguments concern two of the three basic elements of driving; namely, the vehicle and the road.

From a factual standpoint, comparisons were made of motor vehicle registration and fatalities from 1925 to 1949. The comparison is between reported motor vehicle fatalities within the city of Grand Rapids itself and the motor vehicle registration within Kent County wherein the city of Grand Rapids is located. It has been estimated that approximately 86% of the vehicles located within the county are registered within the city limits. It is interesting to note that before the figures themselves are discussed, the exposure rate of 1950 is at least six times as great as that of 1925 in view of the fact that not only has motor vehicle registration been doubled but that, in addition, gasoline consumption for vehicles has tripled.

As shown in the accompanying table, it can easily be seen that despite the fact mileage on our roads has increased, the rate of fatalities per 10,000 vehicles registered has steadily decreased, particularly during the last decade, from a maximum rate of 6.51 in 1925 to a minimum rate of .97 in 1949.

Getting back to the third basic element of driving, namely, the driver, something must have accounted for this tremendous drop in rate, in view of the fact that the exposure has continuously increased. Undoubtedly, the three E's of education, enforcement and engineering can, without any equivocation, claim the major share for this improvement.

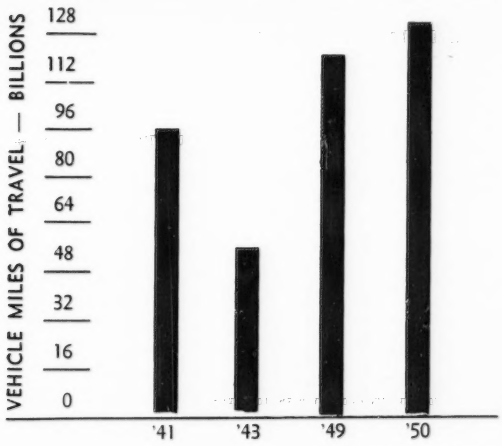
From the above statistics it certainly can be shown that all of our drivers of today through the above-mentioned influences are doing a much better job than their predecessors; and while no particular credit as such can be given to the young drivers, they at least must be included in the general over-all picture of improvement. In other words, the young driver of today is a safer and more skillful operator than his parent was at his younger age.

The comparison has been made with particular regard to counteracting the pessimistic attitude taken by many of our agencies, particularly those dealing with motor vehicle safety, who should possibly begin to take some credit for the tremendous gain they have made, and will continue to make, toward the overall improvement of our transportation system.

Comparison of Fatalities & Registration in Kent County, Michigan, from 1925 to 1949

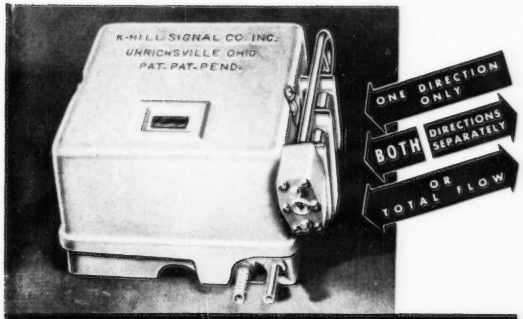
Year	Fatalities	Registration	Fatality Rate Per 10,000 Registered Vehicles
1925	35	53,802	6.50
1926	12	60,493	1.98
1927	22	63,741	3.45
1928	21	67,812	3.10
1929	22	72,292	3.00
1930	29	69,535	4.17
1931	14	63,713	2.20
1932	16	57,783	2.77
1933	9	53,976	1.67
1934	24	55,834	4.30
1935	23	58,197	3.95
1936	22	64,511	3.41
1937	29	71,448	4.06
1938	17	68,960	2.46
1939	28	72,868	3.84
1940	23	75,694	3.04
1941	36	80,350	4.48
1942	15	74,021	2.03
1943	16	68,982	2.32
1944	15	68,581	2.18
1945	14	79,672	1.76
1946	20	86,742	2.31
1947	18	86,105	2.09
1948	11	95,362	1.15
1949	10	103,112	.97

Traffic Trends



TRAVEL ON RURAL ROADS FOR FIRST SEVEN MONTHS of 1941, 1943, 1949 and 1950.

Based on Bureau of Public Roads Data



THE ONLY COUNTER THAT COUNTS EACH DIRECTION SEPARATELY OR TOTAL FLOW

K-HILL Dual TRAFFIC COUNTER

NON-ADJUSTING

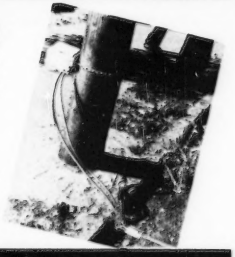
A REVOLUTIONARY DEVELOPMENT IN TRAFFIC COUNTERS COUNTS EACH DIRECTION SEPARATELY OR TOTAL FLOW

Use ONE single road tube on this counter to count total flow.
Use TWO road tubes side by side to count one direction only.
Use these same TWO road tubes with a K-Hill "Dual" Counter at opposite ends of the road tubes to count each direction separately and at the same time.

Both road tubes cross ALL traffic lanes.
No channeling of traffic or divided road tube necessary.
Safer to install. Safer for the motorist.
Traffic flows normally. Greater accuracy.

Same specifications and mechanism as the government approved K-Hill total flow traffic counter.

Send for complete information and prices on this revolutionary "Dual" purpose portable traffic counter.

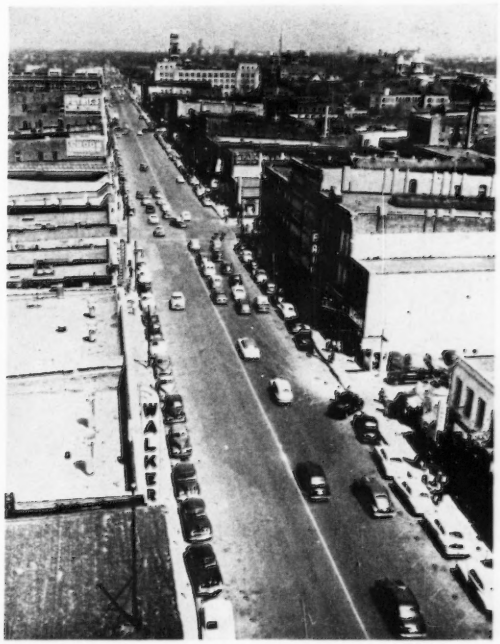


K-HILL SIGNAL CO., INC.
UHRICHSVILLE, OHIO
SINCE 1932

(Continued from Page 15)

accidents were reported, and for the three months after, one accident has been reported.

There is other definite evidence that less congestion exists and traffic operates in a more fluid manner, especially on Main Street. Not a single complaint has been received concerning the change; this was due, to some extent, to the establishment of one-hour parking regulations instead of two-hour regulations, and to the extension of the parking meter area on Main Street for an additional four blocks.



Looking north on Main from Douglas "AFTER" angle parking was removed.

California Road Conference Scheduled

California's Conference on Street and Highway Problems, an annual event for road men from every level of government and private enterprise concerned with highways, roads, and streets, has been scheduled for January 24-26, 1951. The meeting will be held on the Berkeley campus of the University of California. First organized in 1949, the conference is presented each year by the Institute of Transportation and Traffic Engineering of the University of California. Chairman for the 1951 meeting will be Ralph G. Wadsworth, City Engineer of San Francisco.

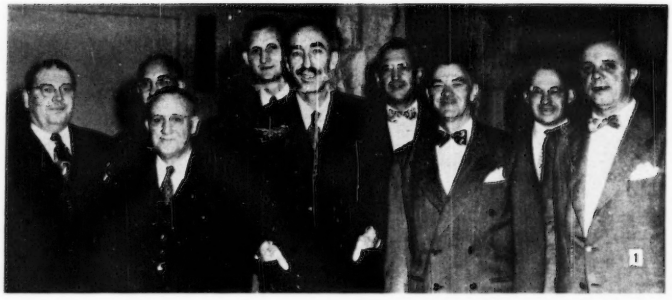
TRAFFIC NEWS

450 Attend ITE Annual Meeting

The 21st Annual Meeting of the Institute of Traffic Engineers, held at the Commodore Hotel in New York City, drew the largest attendance in the history of the organization. More than 450 highway officials and traffic engineers, and their wives, from all parts of the United States and Canada participated in the various technical and social events. The Annual Business Meeting on Sunday exceeded all previous attendance, with approximately 125 members on hand to hear the various reports of officers and committee chairmen. Many important decisions were made at the Board of Direction meetings and at the Annual Business Meeting that will be recorded in later issues of "Traffic Engineering" magazine.

Among the important dignitaries in attendance at this meting were: Charles E. Hollinghurst, Ministry of Transport, London, England; W. H. Schoch, Police Commissioner, Zurich, Switzerland; Dr. R. J. Smeed, Deputy Director of Road Research, Road Research Laboratory, London, England; and Aime Cousineau, Director, City Planning Department, Montreal, Canada.

The newly elected President of the Institute, Harry E. Neal, Chief Engineer, Ohio Department of Highways, Columbus, Ohio, who holds the distinction of being the first state traffic engineer to be elected to this important position, opened the first technical session Monday morning. President Neal introduced Lloyd B. Reid, Commissioner of Traffic of the City of New York, who in turn introduced Acting Mayor Vincent Impellitteri who welcomed the delegates to the City. Mr. Impellitteri praised the work that had been done by Mr. Reid's department and called upon the Institute to assist in solving the complex traffic problems that beset the City of New York. He said that the city was attacking the problem of street traffic congestion on a broad front and trying "desperately" to get private capi-



[1] The new Board of Direction in an informal pose during the annual banquet. Left to right, front: Director Donald M. McNeil; President Harry E. Neal; Vice-Presidents F. B. Crandall and Nathan Cherniack; and Secretary-Treasurer Harry Porter Jr. Back row: Directors Joseph L. Wehmeyer; Wilbur S. Smith, immediate past president; James E. P. Darrell and C. W. Prisk. New Directors F. M. Carter and Thomas E. Willier were not present.

[2] Acting Mayor Vincent Impellitteri officially welcomes the delegates to 21st Annual Meeting.

[3] Robert A. Mitchell, Chairman of the Editorial Board, presents Henry K. Evans, Editor, with a special gift from the Board of Direction for his work on the 1950 edition of "Traffic Engineering Handbook." Looking on at left is Honorary member Charles J. Tilden and President Harry E. Neal, right. The brief ceremony took place during the annual banquet.

[4] Immediate past presidents Wilbur S. Smith and Robert A. Mitchell strike a pose after receiving past presidents' certificates from President Harry E. Neal. Shown at left are two of the Institute's guests of honor at the annual banquet: W. H. Schoch, Police Commissioner, Zurich, Switzerland, and Charles J. Tilden.

tal to invest in parking facilities.

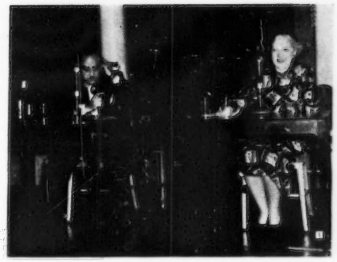
Midtown relief was forecast by Mr. Impellitteri with the opening of the Port Authority Bus Terminal, Fortieth Street and Eighth Avenue, now in the final stages of construction. He explained that it would rid crowded streets of thousands of inter-city and interstate buses.

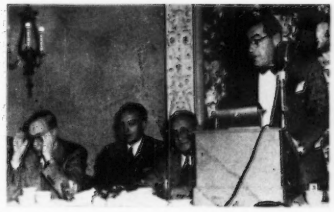
In response to the welcome extended by the Mayor, President Neal cited the growth of the Institute and called attention to the fact that the Institute was officially organized at a meeting in New York City in January, 1931 with 30 charter members. He pointed out that the Institute has increased its total membership to approximately 550 since that time.

Lee C. Webb, superintendent of the Port Authority Bus Terminal, was the first speaker to present a technical paper. He described New York City as unique in having 5,000 daily bus movements in and out of the city. He stated that the new Port Authority Bus Terminal not only will serve to remove 85 per cent of the interstate buses from the city streets, but will permit these carriers to deposit their passengers within a block of Times Square. As an additional traffic relief, he said, the roof of the midtown terminal has been rented for $150,000 a year as a facility to park about 450 cars.

Mr. Webb was followed by D. L. Sutherland, President, Middle Atlantic Transportation Company, New York City, who reviewed the advantages of Union Truck Terminal operations in the Metropolitan New York area. The session closed with an address by Fred W. Moe, President, Ramp Buildings Corporation, New York City, who attributed the garaging shortage in New York City to the failure of the city to evaluate future traffic needs. Zoning ordinances were written to discourage the development of garages in areas where they are needed vitally because of a mistaken theory of preservation of land values, he said.

After luncheon as guests of the Automobile Club of New York, the delegates boarded buses for a field trip to the Brooklyn-Battery Tunnel, Battery Parking Garage, New York Union Motor Truck Terminal and Port Authority Bus Terminal. The trip gave delegates an excellent opportunity to view first-hand the facilities described by the speakers at the morning session.





[1] Mrs. Joseph J. Feuchter (friend hubby on left) has the distinction of being the first female participant in the annual biscuit banter breakfast. She was the star attraction in the opening skit entitled "What happened in Kansas City?" Immediately following, [2] presentation by Harry Porter, right, of a special citation to Henry W. Osborne from the "F&F" club.

[3] President William J. Gottlieb, of the Automobile Club of New York, addresses the delegates at the special luncheon sponsored by the club. Shown at the speakers' table are, left to right: Guy C. Hecker, Managing Director, American Transit Association; Merwyn W. Kraft, of the Local Arrangements Committee; and President Harry E. Neal.

[4] A special christening ceremony was arranged for the annual banquet wherein the new addition to the W. E. "Skinny" DeYoung family, a deodorized skunk, was officially christened by immediate past president Smith. Acting as godfathers are Don Berry, left, and Richard Gallagher. Both Mr. and Mrs. DeYoung seem to be highly elated over the new offspring.

James E. P. Darrell, Traffic Engineer, Minnesota Department of Highways, opened the Tuesday morning technical session by introducing Peter P. Hale, Mowbray, Jones & Hale Associates, New Haven, Connecticut, who delivered a paper entitled "Expressways and the City Plan." In emphasizing the benefits of expressways to mercantile and realty interests, Mr. Hale said: "The staccato stopping and starting of traffic jumping from light to light is the death rattle of downtown business."

Mr. Hale's presentation was followed by two papers on the "Effective Use of O-D Data" and "Estimating Induced Traffic" prepared by West Coast representatives and presented by Harry F. Aumack, Traffic Engineer and Director of Public Transportation, Spokane, Washington, and Richard Gallagher, Director of Public Works, Berkeley, California, respectively, in view of the inability of the original speaker to be present. The session closed with an interesting discussion by Ray E. Jorgensen, Deputy Commissioner and Chief Engineer, Connecticut Highway Department, entitled "Pay As You Go vs. Bond Issues." Commissioner Jorgensen detailed both sides of the question of toll roads vs. free roads, painting up the advantages of the bond issue method of financing toll-free facilities.

Charles W. Prisk, Highway Engineer, U. S. Bureau of Public Roads, Washington, D. C., acted as Chairman for the Tuesday afternoon technical session. In the absence of the scheduled speaker for the subject "The Role of Highway Transport in Civil Defense," Arnold H. Vey, State Traffic Engineer, Trenton, New Jersey, lead a very interesting discussion on this topic. Mr. Vey outlined the preliminary planning now being undertaken by the State of New Jersey in cooperation with New York City authorities in planning for evacuation of the New York Metropolitan area in the event of a national emergency. Mr. E. H. Holmes, Chief, Highway Transport Research Branch, U. S. Bureau of

Public Roads, Washington, D. C., followed with a discussion on the subject of traffic volumes, indicating that traffic has become a dominant part in the economic life of this country.

Burton W. Marsh, Director, Traffic Engineering & Safety Department, American Automobile Association, Washington, D. C., presented an interesting paper entitled "What About the pedestrian?" He reported that 7 of 10 pedestrians killed were men. He attributed this ratio to the comparatively natural caution practiced by women. He further stated that 66 per cent of all pedestrian fatalities were traceable to law violations, with drunkenness a large factor. He further stated that 9 of 10 adults killed while afoot were non-drivers. His analysis showed that the victims did not understand the problems that confronted motorists. Mr. Marsh said that wearing of light-colored clothing would reduce night accidents, as many of these are attributable to the motorist not seeing the pedestrian in time to avoid a mishap.

The session was closed with a very interesting panel discussion on speed limits. Panel members were: J. E. P. Darrell, Traffic Engineer, Minnesota Department of Highways; J. E. Johnston, Traffic Engineer, Nebraska Department of Roads and Irrigation; T. E. Transeau, Director, Pennsylvania Bureau of Highway Safety; and C. C. Wiley, Professor of Highway Engineering, University of Illinois. There was such a wide divergence of views on this important question that the session carried on a full half hour beyond the closing time because of the interesting discussion that developed between panel members and the audience.

The final technical session on Wednesday morning was chairmaned by Donald M. McNeil, Traffic Engineer, Bureau of Traffic Planning, Pittsburgh, Pennsylvania. The session opened with an excellent paper by George W. Howie, Traffic Engineer, City of Cincinnati, Ohio, entitled "Effective Protection for School Crossings." Mr. Howie's major theme revolved around suggested changes in the Uniform Manual on Traffic Control Devices relative to a distinctive type of school sign. It was his recommendation that the Pentagon shape be adopted as standard for school crossings and illustrated his remarks with full scale drawings of typical signs utilizing the new shape.

Mr. Howie was followed by Charles S. Michalski, Engineer of Traffic Design, Department of Traffic, City of New York, who illustrated the proposed progressive traffic signal plan for downtown Manhattan by a specially prepared scale model of the downtown area. By the use of a master controller and miniature signals he was effectively able to illustrate the plan for relief of congestion. James E. Reading, Traffic Engineer, City of San Diego, presented a very interesting discussion entitled "Traffic Provides Its Own Progression" based on progressive signal practices now being utilized in the City of San Diego. The session was concluded with some very interesting remarks by Commissioner Reid entitled "It Takes More Than Traffic Engineering." Commissioner Reid pointed out the many divergent activities daily confronting the city traffic engineer that had a marked bearing on the success of his program but none of which related directly to traffic engineering work.

Approximately 400 of the delegates and their wives were guests of the Port of New York Authority on a tour of New York harbor in the afternoon. The tour also included luncheon aboard the sightseeing yacht. The meeting was officially adjourned by President Neal at the end of the tour.

Dana Joins Dual Parking Meter Company

The Dual Parking Meter Company, Canton, Ohio, recently announced that Deane Dana is now associated with them.

For several years, Mr. Dana was Vice-President and General Manager of Vehicular Parking Ltd. He was responsible for the parking-meter statistics which have been recognized as the authoritative figures of the industry and of metered parking.

Accuracy, impartiality and completeness have been and are the ideal of this detailed job of compilation.

Annual Meeting Resolutions

The following Resolutions were prepared by a special committee and approved by the Board of Direction of the Institute of Traffic Engineers, and the membership, at the 21st Annual Meeting.

1. WHEREAS, the President of the United States has, in recognition of the present national defense requirements and the effectiveness of the Action Program of the President's Highway Conference in increasing safe and efficient highway transportation, directed the Under Secretary of Commerce for Transportation as General Chairman of the President's Conference to:

a. Review the progress of putting the Action Program to work by states and communities.

b. In view of the need for more efficient highway transportation to request states and communities to accelerate activities within the recommendations of the Action Program.

c. Delevop a plan of cooperation with the Department of National Defense for efficient highway movement of defense requirements.

RESOLVED that the President of the Institute of Traffic Engineers transmit to the Under Secretary of Commerce for Transportation, Major General Philip B. Fleming, the desire of the Institute of Traffic Engineers to cooperate fully in carrying out all phases of the President's Directive in the interest of more efficient and safe highway transportation. This communication to particularly express the qualifications of the Institute members who are engaged in highway traffic planning and operation in National, State, and Local positions to assist in carrying out the essential requirements of the task to be performed.

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2. WHEREAS, the present national emergency requires a strong civilian organization for the protection and conservation of human life and resources, and

WHEREAS, the effective utilization and conservation of the nation's transportation facilities are vital in any war emergency, and

WHEREAS, the membership of the Institute of Traffic Engineers includes, at all levels of government, recognized specialists trained in the planning and control of the movement of highway traffic now, therefore,

BE IT RESOLVED, that the Institute of Traffic Engineers offer to the National Security Resources Board the services of its members to participate in the national planning for the effective use and conservation of transportation resources, and

BE IT FURTHER RESOLVED, that State and Local Defense Councils be urged to call upon the members of the Institute of Traffic Engineers for Technical advice and services in their respective jurisdictions.

—o—

3. RESOLVED, that those members in attendance at the 21st Annual Meeting, and in behalf of those who were unable to be with us, extend to our outgoing President, Wilbur S. Smith, our sincere appreciation for his wise and vigorous leadership of the Institute of Traffic Engineers for the past year during which period the Institute has not only increased in members but has continued to increase in prestige and influence in the traffic and transportation matters of the nation. We shall continue to look to him for his wise counsel in future affairs of the Institute.

—o—

4. RESOLVED, that these in attendance at the 21st Annual Meeting of the Institute of Traffic Engineers extend our sincere appreciation to Bill Lenz and to the supporting organizations listed in the official program for their valuable contributions to the success of this memorable annual event of the Institute in New York City, and

BE IT FURTHER RESOLVED, that the Board of Direction recognize the support of these 32 organizations by an appropriate letter of appreciation to each of these organizations.

—o—

5. WHEREAS, the 21st Annual Meeting of the Institute of Traffic Engineers has been an outstanding success with respect not only to programs, attendance and interest but also as to arrangements for the comfort, convenience and entertainment of delegates and guests, and

WHEREAS, the planning which has made possible this successful meeting is the direct result of the thought and painstaking efforts of the local arrangements committee, now, therefore, be it

RESOLVED, that the Institute of Traffic Engineers extend its grateful thanks and appreciation to the New York Section, ITE, for its hospitality and to Edward Wetzel, Chairman of Local Arrangements, and T. T. Wiley, Chairman of Technical Sessions Committee, as well as to all members of these committees as listed on the official program for giving so freely and willingly of their time and energy on our behalf.

Resolutions Committee

J. E. P. Darrell, *Chairman*
E. H. Holmes
Robert A. Mitchell
Arnold H. Vey
Light B. Yost

Contributing Organizations to Annual Meeting

The following organizations contributed to the success of the 21st Annual Meeting (note Resolution No. 4).

American Gas Accumulator Co.
Automatic Signal Division
Automobile Club of New York, Inc.
Crouse-Hinds Co.
Dual Parking Meter Co.
Duncan Meter Corp.
Edwards & Kelcey
General Electric Co.
A. J. Gerrard & Co.
Grote Mfg. Co., Inc.
International Meters, Inc.
Karpark Corp.
Kelly-Creswell Co.
Kopp Glass, Inc.
Lyle Signs, Inc.
Marbelite Company, Inc.
Minnesota Mining & Mfg. Co.
Naz-Dar Co.
New York City Board of Transportation
Port of New York Authority
Portland Cement Association
Prismo Safety Corp.
Public Service Coordinated Transport
Rand McNally & Co.
Reflexite Corp.
Remington Rand, Inc.
M. H. Rhodes, Inc.
Streeter-Amet Co.
Texas Co.—Texaco National Road Reports
Traffic & Street Sign Co.
Union Metal Manufacturing Co.
Western R. R. Supply Co.

ITE Member Featured In "LOOK Applauds"

"He has a dozen ideas a minute; 11 of them are not worth a damn, but the 12th is usually worth a million." This is how Norman Damon (Affiliate Member, ITE), Vice-President of the Automotive Safety Foundation, was once described. The million might have referred to the human lives that his safety programs have saved since he took an interest in traffic problems twenty-eight years ago.

Damon believes that ninety per cent of accidents are avoidable; that annual traffic fatalities could be reduced by 20,000. He certainly practices what he preaches. After twenty years of driving he has only one slightly bent fender to his discredit.

LOOK Magazine
September 12, 1950

LOOKING AHEAD

NOVEMBER 26-30, 1950—HOUSTON, TEXAS
International City Managers' Association. Shamrock Hotel.

DECEMBER 4-7, 1950—MIAMI, FLORIDA
36th Annual Meeting. American Association of State Highway Officials.

JANUARY 8-12, 1951—WASHINGTON, D. C.
30th Annual Meeting. Highway Research Board. Academy of Science Building, 2101 Constitution Avenue.

1951 ANNUAL MEETING, INSTITUTE OF TRAFFIC ENGINEERS, SCHEDULED FOR LOS ANGELES, CALIFORNIA.

Indiana traffic officials were among those paying tribute to the motor division of Schenley Industries, Inc., headquartered at Lawrenceburg, for its four-year record of nearly 3,000,000 miles of transcontinental driving with only one chargeable accident. Shown attending a recognition luncheon in Cincinnati, Wednesday (June 21) are: left to right, James Van Namee, Louisville, Ky., supervisor of the Liberty Mutual Insurance Co., who presented the safety trophy pictured to A. George W. Brown (second from left), head of the motor division; James H. Mohr, Indianapolis, director of the Indiana Traffic Safety Commission; and Lt. Elmer E. Hollenbach, Connersville, supervisor of the southeastern area for the Indiana State Police.

Initial Major Step Is Taken On Big Project

The first major step toward actually executing the $8,000,000 railroad grade crossing separation plan for Beaumont was taken by the city's official family when an agreement was reached that the internationally-known firm of De Leuw, Cather and Company will be retained as consulting engineers on the project. The announcement came from Mayor Otho Plummer following a two-hour conference with L. H. Cather, vice-president of the engineering firm, of Chicago, and Harlan H. Hugg, resident engineer for the firm on the El Paso grade separation plan now nearing completion, Mayor Plummer, City Manager Willie J. Brockman and City Attorney George Murphy, who headed the city's railroad committee which brought in the recommendation of the city's plan for grade separations.

—*Beaumont Texas Journal*

Comprehensive Parking Survey Undertaken in St. Louis

One of the largest parking surveys of its type ever undertaken in this country has been inaugurated in St. Louis by the Missouri State Highway Department and the U. S. Bureau of Public Roads. Joseph Feuchter (Mem., ITE) has been named Director of the survey.

The survey began June 1st with a factual determination of all existing parking facilities in the downtown district. Motorists parking on streets and lots, and in garages, in the downtown district and adjoining areas, will be questioned by traffic survey interviewers. A total of $50,000 in Federal funds has been made available for the survey.

RIP Stop Signs at VAN WINKLE

Regulatory stop signs go out on U. S. Highway 80 and Van Winkle near Jackson, Mississippi, in favor of *the first Semi-Actuated Traffic Installation in the State.* It's an Eagle Semi-Actuated Controller with two 2-way, 4 light, adjustable suspension type Eaglelux Traffic Signal. Double red indications for added protection account for the fourth indication in all four directions.

Mr. A. M. White (Mem., ITE), Assistant Engineer of Maintenance, Mississippi State Highway Dept., makes appropriate gesture, as J. B. Brinkley, Foreman of Highway Dept. Sign Shops, surveys the recently completed installation.

New Traffic Engineering Handbook

Contributing authors are 16 of the Nation's leading traffic and transportation engineers.

Text reviewed by 35 specialists and authorities covering a broad cross section of the field.

Preparation under direction of Traffic Engineering Handbook Editorial Board.

SOME FEATURES:

520 pages; 215 illustrations; 205 tables and 489 definitions of traffic terms.

CONTENTS:

I Vehicle Travel and Highway Facts
II Vehicle Motion
III The Driver
IV The Pedestrian
V Traffic Accidents
VI Traffic Studies
VII Traffic Markings and Markers
VIII Traffic Signs
IX Traffic Signals
X Parking and Loading
XI One-Way Streets and Arterial Routes
XII Roadside Capacity and Design
XIII Speed Regulation and Zoning
XIV Traffic Islands and Pedestrian Barriers
XV Pedestrian Islands and Bus Loading Zones
XVI Street and Highway Lighting

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M. H. Rhodes, Inc. welcomes your inquiries and is ready at all times to have its engineers consult and cooperate with your traffic officials. There's no obligation. Write today for complete information on the new Mark-Time "Hurricane" manual meter.

Manufactured and sold in Canada by Ontario Hughes Owens Co., Ltd., Ottawa, Ontario

M. H. RHODES, INC. MARK-TIME HARTFORD, CONNECTICUT

Statement of the ownership, management, and circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) of Traffic Engineering published monthly at Plainfield, New Jersey, for October 1, 1950.

State of New Jersey }
County of Union } ss.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Interstate Printing Corporation, Plainfield, N. J.

Editor—Robert S. Holmes, Strathcona Hall, New Haven 11, Conn.

Managing editor—Miss Ann S. Lincoln, Strathcona Hall, New Haven 11, Conn.

Business manager—Miss Ann S. Lincoln, Strathcona Hall, New Haven 11, Conn.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.).....

OSMUN FORT,
Publisher

Sworn to and subscribed before me this 6th day of October, 1950.

WILLIAM L. CHRISTIAN,
[Seal] Notary Public of N. J.
(My commission expires March 5, 1952)

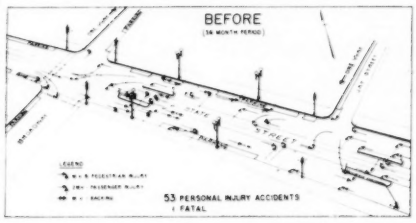
GETTING RESULTS
Through Traffic Engineering

TRAFFIC SITUATION No. 16

ACCIDENT REDUCTION THROUGH PEDESTRIAN CONTROL

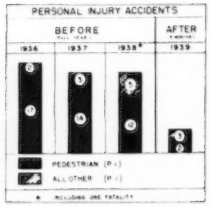
PROBLEM: A serious accident situation, due to the promiscuous and uncontrolled "jay-walking" of pedestrians was resulting in a large number of personal injury accidents along a one-block section of State Street in the business district of Schenectady, New York.

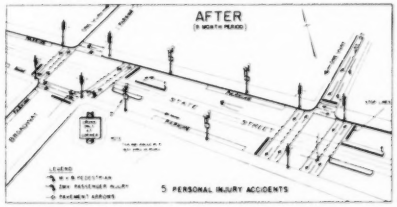
ACCIDENT FACTS: Fifty-three personal injury accidents, including one fatality, were reported over a period of three years prior to improvements. A majority of these accidents were caused by pedestrians attempting to cross in mid-block areas.



FIELD STUDIES: Observation revealed that the existing signals were inadequate for the proper coordination of pedestrian and vehicle movement, and no regulation prohibited the free use of the mid-block section for crossing. Crosswalk lines were either missing or inadequate and parking was permitted too near the intersections. A volume study showed a total of 6599 vehicles eastbound and 8624 vehicles westbound on State Street, between the two intersections, during a fourteen hour period. Pedestrian volume, based on one-hour counts, showed an average mid-afternoon concentration of 2883 on the north side of State Street, and 2278 on the south side of State Street, traveling between the two intersections.

SOLUTION: New traffic lights providing a "Walk" signal were put into operation at the two intersections shown in the diagram. Signs were erected on poles at the mid-block locations, directing pedestrians to "Cross Only at Crossings". Existing crosswalk lanes were widened, new lanes were provided and Stop lines were painted back of the crosswalk. Parking was restricted for a greater distance from the intersections and special laning was provided on Jay Street for right and left turns in order to clear a greater volume of traffic out of this street in a shorter interval of time. This was necessary due to the addition of the pedestrian interval in the new traffic lights. Officers were stationed initially at the mid-block location to direct pedestrians to cross at the intersection, but in a short time were removed due to excellent cooperation by the public. Officers were also assigned to the intersections for a period from 6:00 P.M. to 9:00 P.M. to replace regular traffic officers going off duty. The total cost of the improvements in this area was estimated at $1900.





CHECK BACK: In a nine months period following the improvements there were only five personal injury accidents, of which two involved pedestrians. This indicates a 69% reduction in accidents over an average nine months period of each of the previous three years.

Issued by the Accident Prevention Dept., Association of Casualty & Surety Companies, 60 John St., New York 7, N. Y. Mr. Fisch was recently appointed Deputy Superintendent of the New York State Department of Public Works.

Example Contributed By

Fred W. Fisch, Director,
Bureau of Traffic and City Planning,
City of Schenectady, N. Y.
Member, Institute of Traffic Engineers.

Modern Lighting Standards

The Elreco Corporation of Cincinnati, Ohio, manufactures several styles of standards and brackets. These are illustrated in the company's new catalogue which also contains a set of line drawings, tracing street lighting standard design from 1895 to the present time. For further information, write The Elreco Corporation, Cormany Avenue, Cincinnati 25, Ohio.

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When Writing
To Advertisers

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Monotubes are designed to meet the most modern, accepted street lighting requirements. They're attractive, too . . . blend harmoniously with their surroundings—business or residential. They're cold rolled for exceptional strength, have one-piece construction for easy installation. Maintenance is rarely required.

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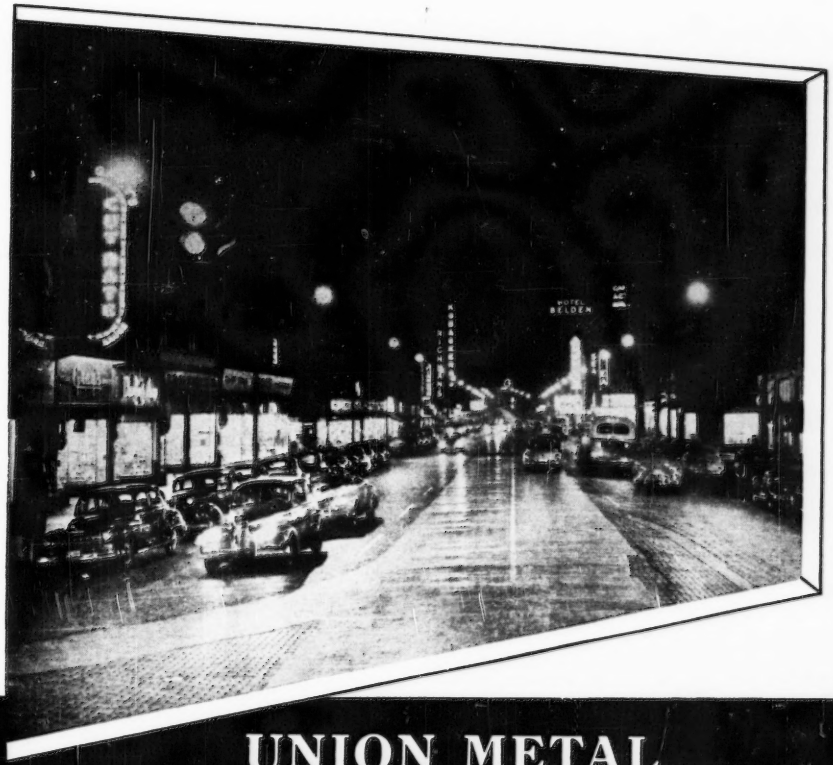


UNION METAL

Monotube Street Lighting Standards

Personalities . . .

PAUL L. GREEN states that while it's a matter of opinion as to whether or not there is anything in a name, at least there's something appropriate in the name GREEN for one who has been spending some twenty years to put the maximum amount of that color into traffic signals. Furthermore (skipping lightly over the PAUL) the nickname was "Red" before he lost most of it

trying to keep up with operatives Skinny DeYoung, Dick Wilcox, et al. So perhaps it was inevitable from the start that he should become all tangled up with red and green traffic lights.

Paul graduated from Sheffield Scientific School of Yale University in 1920 with a Ph.B in Mechanical Engineering, and shortly thereafter began with the Bridgeport Brass Company as a Process Engineer. Most of this work was in connection with brass melting by the electric inducted furnace method, then a relatively new development, and shortly he was attached permanently to the Electric Casting Department. Concerned largely at first with furnace development and casting and metallurgical research, he gravitated by degrees into the production end until in 1926 he was placed in charge of all casting operations of the company, including melting by electric induction, arc, and oil-fired furnaces, and by the now almost extinct pit fire process. He was also in charge of the in-service foreman training program of the company.

Interested always in education, in 1925 Paul was one of the founders of the Bridgeport Engineering Institute, an evening technical school of college level that has since amply fulfilled its early promise. He organized the mathematics department and headed it until 1928.

In the fall of the preceding year the corner of Orange and Humphrey Streets in neighboring New Haven saw a new form of signal control known as "traffic-actuated," the brain child of Harry Haugh, a classmate of Paul's at Yale. Forsaking his brass making, in the spring of 1928, he heeded the siren call of traffic-actuation and joined up with the newly formed Automatic Signal Corporation in New Haven. He soon learned that the signal business is a full-time job and reluctantly gave up evening teaching and administrative work with the Bridgeport Engineering Institute.

Those were the days when signal control was just hitting its stride and there were still a few undecorated corners. Controllers were not too far removed from their sign flasher genesis. There were some who predicted that this newfangled traffic-actuation with "pads in the street" would never amount to anything. However Automatic set out to prove them wrong and Paul figures there is now general agreement that they have succeeded. His part of the job has been very largely in the selling end, well seasoned with engineering and development work.

After four years with Automatic and with the depression daily hitting new lows, Red took over the duties of Sales Manager in January, 1932—largely as he recalls because no one else wanted the job. At any rate from the doubtful vantage point of that depression year there was no place to go but up. The company moved to East Norwalk in 1937 and after an interlude of war production, became in 1946 a division of Eastern Industries, Incorporated. One of their most important post-war developments has been the radar speed meter now widely used in engineering and enforcement work. The manufacturer of Eastern's industrial mixers was transferred to the Norwalk plant in 1948 and shortly thereafter Paul's job was extended to include management of mixer sales.

(See GREEN, Page 32)

HENRY K. EVANS remembers that his high school days in Santa Maria, California, were filled largely with activities in connection with music and amateur shortwave radio. He organized a dance orchestra at the age of fifteen, which provided the remuneration necessary to support the shortwave radio hobby. The usual procedure was to retire to the radio room after the dance

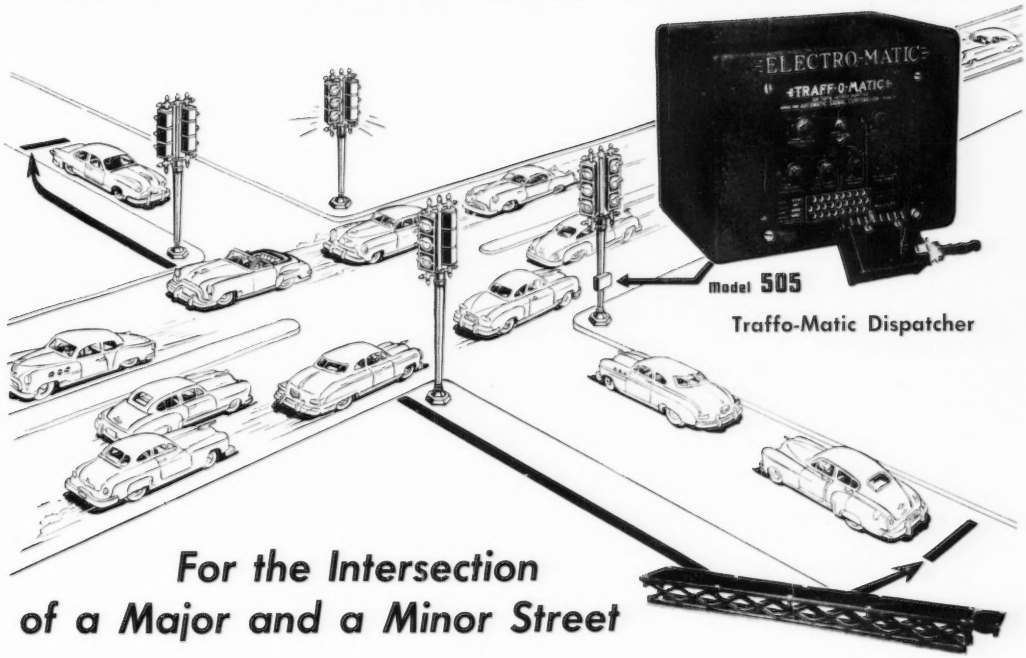
engagement and "pound brass" from then until dawn, talking with other "hams" around the globe. After being named valedictorian of the graduating class and receiving a scholarship to the California Institute of Technology, he found the music hobby to be a needed income source as well as a hobby, and the orchestra business became so interesting that it almost drew him away from the engineering profession. In addition to being elected to Tau Beta Pi, he managed to squeeze in the wrestling team, band, orchestra and glee club on the side, and received a B.S. in Engineering in 1938.

The Yale Bureau of Highway Traffic beckoned, so the next year was spent in New Haven under the tutorage of Miller McClintock, Ted Matson, et al. It was here that Hank met the future Mrs. Evans through her brother, Henry Osborne (now City Traffic Engineer of Buffalo) with whom he roomed. While at Yale, Hank originated the infamous publication "TE99," the official class bulletin, which was carried on for some time. Later he became editor of the "Traffic Bulletin," official organ of the now defunct Traffic Research Associates.

After completing the year at Yale,

TRAFFO-MATIC

SEMI-ACTUATED CONTROL



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NORWALK, CONNECTICUT

Hank worked for the Automobile Club of Southern California for several years, followed by short assignments with the WPA as Traffic Survey Project Technician and the FBI as a special instructor.

After a year with the National Council, Hank joined Harold Hammond at the National Conservation Bureau in New York City and helped prepare the original Manual of Traffic Engineering Studies. Later he became director of the Traffic Engineering Division and conducted a number of city and state traffic surveys, and carried on several research projects connected with accidents and short count traffic studies. It was during this period that he became editor of "Traffic Engineering" magazine and evolved the cover format and several other features which are still being used. "Who's Who in Traffic Engineering" (now known as "ITE Personalities") was among those features originated. He was also successively Secretary, Vice-President and President of the New York Metropolitan Section, ITE, during his sojourn in New York City.

A short "hitch" in the Army Infantry cost Hank thirty pounds of avoirdupois and taught him how to kill a man in several easy ways. Shortly after discharge from the Army he retired to his native California as resident engineer for DeLeuw, Cather and Company, directing the San Francisco transportation planning project, involving detailed recommendations for expressways, subways, public transit facilities, parking and accident prevention measures.

At the conclusion of the West Coast project, Hank accepted his present position as Highway Transportation Specialist with the United States Chamber of Commerce. His activities deal largely with highway financing and legislation, interstate commerce and service to local chamber officials in connection with traffic and transportation problems.

Among his many journalistic accomplishments, Hank jointly authored the book "Traffic Engineering and the Police," with Franklin Kreml, and prepared the first traffic engineering correspondence course, soon to be released by the University of California. He is editor of the second edition of the "Traffic Engineering Handbook" and is at present editing the second edition of the "Manual of Traffic Engineering Studies." He has authored many articles and pamphlets dealing with traffic engineering and survey techniques. He is a registered professional engineer (California), Member of ITE, and a member of various national and local committees including the Highway Research Board's Traffic and Operations Committee.

The Evans celebrated their 10th wedding anniversary recently in their home in Silver Spring, Maryland, where they look after three redheaded boys, a dachsund, a hamster, and a partially assembled "ham" radio station. Hank has joined the musicians union so perhaps will get a few kinks out of his fingers on Saturday nights.

GREEN . . .

(Continued from Page 30)

Within the Institute, of which he became an Associate Member in 1934, Paul has taken particular interest in committee work in connection with control equipment, specifications and standards, and in preparation of material for the ITE Handbook. From 1936 to 1940 as Chairman of the Publications Committee he was responsible for the Institute's "Traffic Control and Facilitation" section of the AMERICAN CITY MAGAZINE. Paul states that those were the days when it was like pulling teeth to drag out of the membership enough material to meet the deadline for each issue—all this in marked contrast to the smoothly functioning editorial staff which has made out own TRAFFIC ENGINEERING so successful.

Among his other committee activities Paul thinks there should be mention of the days when the "goings on" of the Biscuit Banter Breakfast Resolution Committee were rather less inhibited than of late. For details, reference may be made to the survivors of the Farmers' Protective Association, originating in Chicago, which flourished in the early 40's. Having been voted by the irate Farmers "the one most to be protected against" he makes claim to the unique (and fortunate) distinction of being one of the few who has ever been hung in absentia or otherwise, and then presented with the hangman's noose—courtesy of Lew McIntyre who has by now almost forgiven him.

Paul's home is in Bridgeport, Connecticut, where he lives with his good wife, Mildred, and daughter, Peggy, the latter a college sophomore. The hobby department has tended to become a bit neglected of late and needs increased attention. Until recently a particular seasoned devotee of skating, the prudence of increasing age and a regard for private and public safety have all but eliminated this sport (although he still frequently finds himself "on thin ice" in all seasons). There remains a low grade of golf, ditto of bridge, and a liking for such things unrelated to traffic as an amateurish dabbling in poetry.

Obituary

Otto K. Jelinek (Mem., ITE), 50, Chicago Park District engineer who was largely responsible for the planning of the North Outer Drive, died August 17, 1950, of an apparent heart attack in Brussels, Belgium.

Word of Mr. Jelinek's death was received in a cable sent to Ralph H. Burke, an associate consultant engineer.

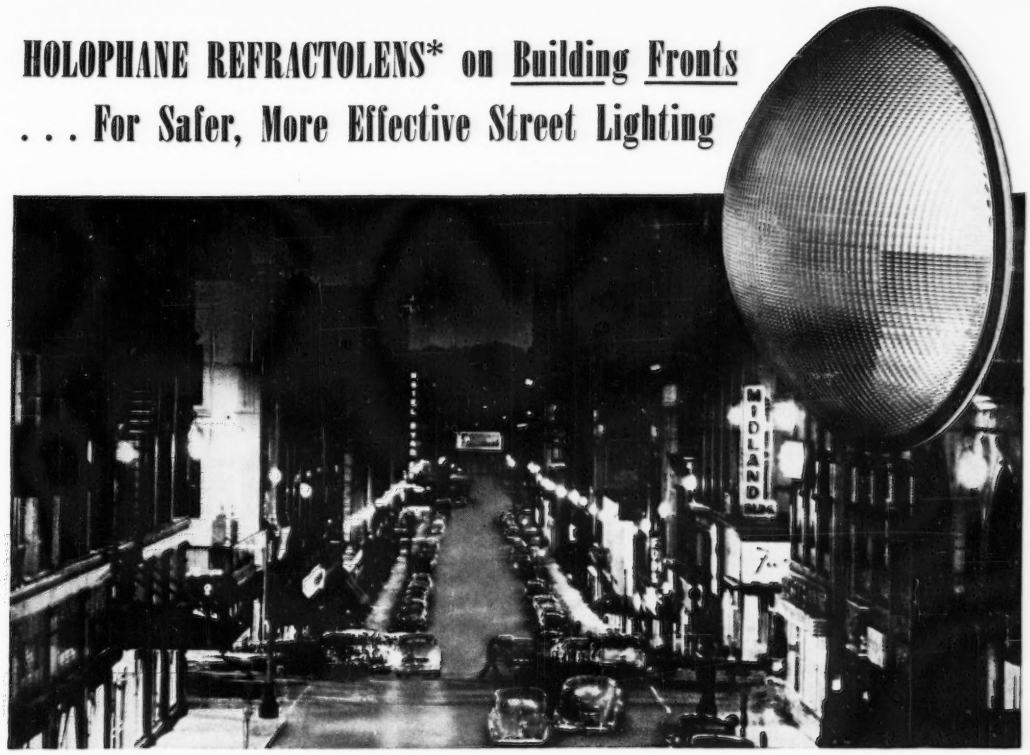
Mr. Jelinek had flown to Europe to visit his son, Otto Jr., who was studying hotel management in Switzerland. He was accompanied by his wife, Rose.

In 1930 Mr. Jelinek became traffic engineer for the South Park Commission and in 1933 and 1934 designed and handled traffic facilities for the Century of Progress Exposition. He became chief planning engineer for the Chicago Park District in 1945 and the following year became associated with Ralph Burke, in the design and construction of airports for the City of Chicago.

Mr. Jelinek was elected to membership in the Institute of Traffic Engineers in 1934 and was a member of the Chicago Plan Commission and the American Road Builders Association. He was a director of the Equitable Savings & Loan Association and was licensed as a professional engineer in Illinois and many other states.

Services were held in Paris, France.

HOLOPHANE REFRACTOLENS* on Building Fronts
. . . For Safer, More Effective Street Lighting



Street Scene, 1950 . . . In St. Paul, Minn., Business Section

26 Feet above street level . . the Holophane Refractolens (upper-right) is mounted to the building front. The double-refracting lens (20" diameter) is designed to resist heat, shock and deterioration.

"The new lights, providing about 10 TIMES more illumination on the street, are far superior to the old lights from the standpoint of glare" . . .

From an official report of St. Paul Engineers

When St. Paul authorities envisioned an altogether new method of illuminating streets in the business section, they called in street lighting consultants. Result: the new Holophane REFRACTOLENS set into a General Electric fixture, and mounted flush to the front facades of buildings for twenty-two midtown blocks . . . Outstanding advantages: cheerful white light 10 times brighter than before; elimination of obstructive lamp posts and brackets; remarkable uniformity of light; maximum visibility for both motorist and pedestrian; reduction of night traffic accidents; stimulation of retail business . . . Holophane Street Lighting Engineers will send, without obligation, engineering data and complete details of "St. Paul's Whiteway".

*Reg. U. S. Pat. Off.

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PETERMAN, WALTER C. (Assoc.)
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Traffic Engineer
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STEWART, A. LYNN (Junior)
Assistant Traffic Engineer
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Berkeley 4, California

TERRY, DEAN S., JR. (Junior)
Traffic Engineering Associate
Department of Traffic Engineering
City Hall
Los Angeles 12, California

UPHAM, CHARLES M., SR. (Affil.)
Consulting Engineer
Suite 102, Willard Hotel
Washington, D. C.

VANDERSTEMPEL, THEODORE M. (Member)
Engineer, Bureau of Street Traffic
Room 709, City Hall
Chicago 2, Illinois

SECTION NEWS

New England Section

The Annual Meeting of the New England Section, ITE, was held May 29, 1950 at the State Fair Restaurant in New Haven. Fifteen members and three guests attended. Following the usual procedure, the following officers for the ensuing year were nominated and elected unanimously:

Robert G. Mitchell, President
Peter P. Hale, Vice-President
F. Houston Wynn, Secretary-Treasurer

The newly-elected officers met in executive session at the Taft Hotel, New Haven, the evening of June 6 and discussed the problem of encouraging an active New England Section during the next year. A tentative program of five meetings was decided upon. Tentative dates and topics are as follows:

Tuesday, October 24, 1950—at New Haven—*"Justifying New Toll Facilities"*—one of the outstanding national authorities to discuss the economic factors involved in the construction of toll facilities.

Tuesday, December 5, 1950—at Hartford—*"Legal and Economic Problems Created by Limited Access Highways in Urban Areas"*—probably a panel consisting of a city planner, a highway planner, a right-of-way agent, and/or a real estate appraiser.

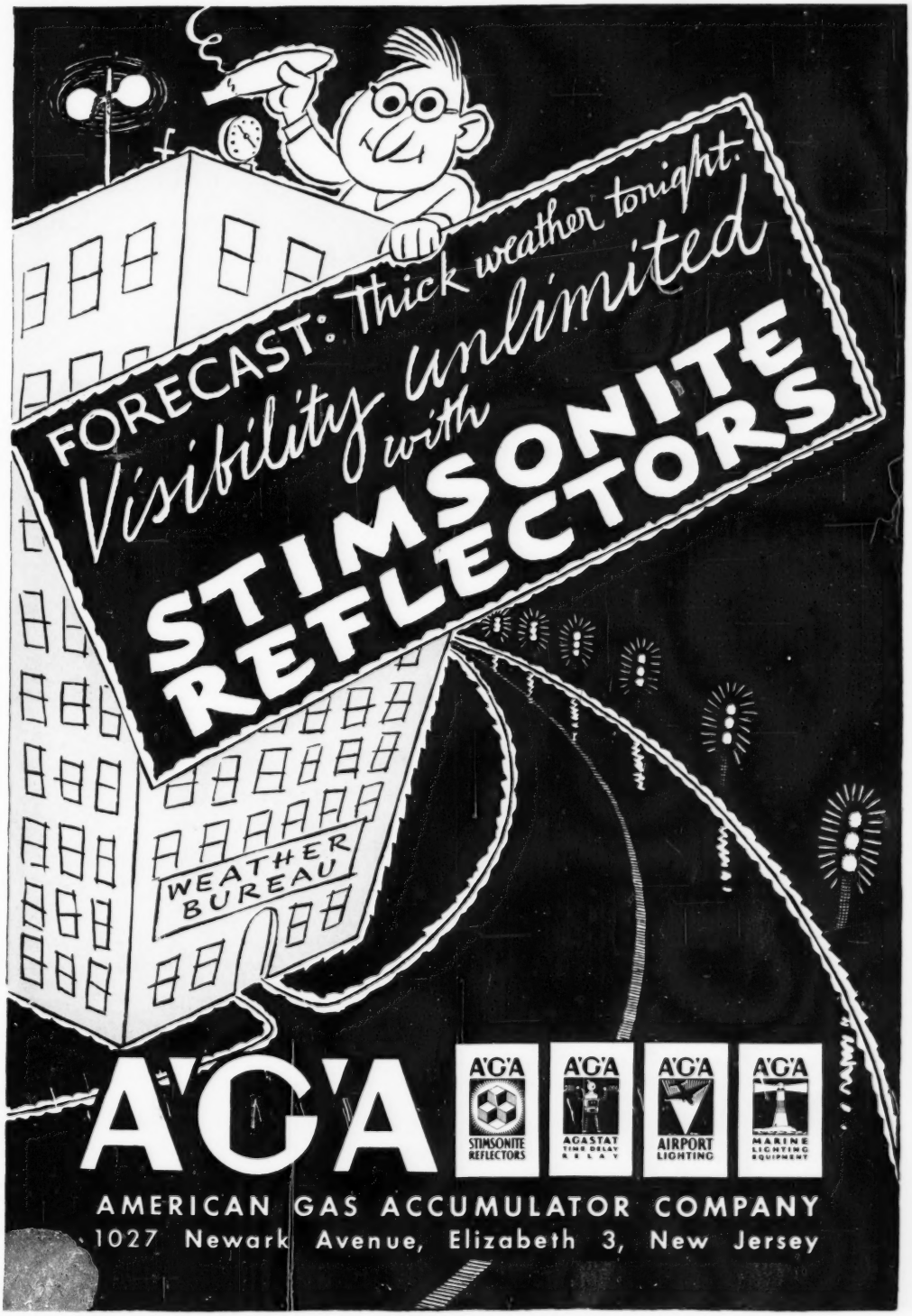
Tuesday, January 16, 1951—at New Haven—*"Enforcement and the Courts"*—a panel to consist of one or more traffic court judges and one or two traffic police to discuss the court and police side of enforcement and law interpretation.

Tuesday, March , 1951—at Hartford—*"Mechanical Development of the Automobile"*—a panel to discuss the "latest inventions" in the motor vehicle industry, many of which were employed in the early days of the motor vehicle but were ahead of their time for one reason or another.

Tuesday, May , 1951—at New Haven—*"Latest Urban Highway Design Standards"*—hope to hear one of the Bureau of Public Roads men when they visit Yale Bureau.

At the present time there are forty ITE members residing in New England; twenty-five in Connecticut; five in Rhode Island; nine in Massachusetts;

Above photograph shows the large delegation attending the Business Meeting of the Western Section, ITE, on August 3, 1950. Shown at speakers' table are: newly elected President, Fred Fowler; continuing Secretary-Treasurer, Al Head; immediate past President, Jim Reading; national Executive Secretary, Robert S. Holmes; and national Vice-President, Bruce Crandall.


FORECAST: Thick weather tonight.
Visibility unlimited with
STIMSONITE REFLECTORS
WEATHER BUREAU
A'G'A
A'G'A STIMSONITE REFLECTORS
A'G'A AGASTAT TIME DELAY RELAY
A'G'A AIRPORT LIGHTING
A'G'A MARINE LIGHTING EQUIPMENT
AMERICAN GAS ACCUMULATOR COMPANY
1027 Newark Avenue, Elizabeth 3, New Jersey

and one in Maine. It is possible for a majority of the members to attend the regular Section meetings. This year we plan to invite a number of interested visitors to each meeting, probably a different group each time; the selection depending on the topic under discussion.

Western Section

Thirty-seven members and guests were in attendance at the Third Annual *Business* Meeting of the Western Section, ITE. It was reported that approximately 150 delegates attended the Third Annual Meeting or the Western Section, ITE. After President Reading appointed tellers to canvass ballots for officers for the forthcoming year, he introduced new members of the Section since the last meeting, and guests. The Secretary gave a report of the activities of the Western Section for the past year and also a brief report on the status of the publication, *Western ITE*.

Following the Secretary's report, President Reading called on area chairmen to report on their various meetings held during the past year. National Vice-President F. B. Crandall gave a brief report on national activities. Executive Secretary Holmes then conducted a question and answer period on the activities of National Headquarters.

Other business included a discussion of changing the fiscal year, changing the dates for the Annual Meeting, and paying a portion of the National Director's expenses to attend a Board Meeting. There was a brief discussion on Section sponsorship of student papers on the subject of traffic engineering.

The subject of making a bid for the 1951 Annual Meeting of the Institute of Traffic Engineers was brought up for discussion and it was moved and seconded that the Western Section would make a bid for the 1951 Annual Meeting of the Institute of Traffic Engineers and that, further, this meeting be held in the city of Los Angeles, California. The motion was passed unanimously. The result of polling the ballots was delivered and President Reading announced that the officers for the forthcoming year were:

President—Fred T. Fowler
Vice-President—Joseph E. Havenner
Secretary-Treasurer—J. Al. Head

Membership Information
may be obtained by writing to
Executive Secretary
Institute of Traffic Engineers
Strathcona Hall
New Haven 11, Connecticut

MEMBERSHIP ELECTIONS

BARRY, WALTER A., JR. (Assoc.)
Traffic Engineer
DeLeuw, Cather & Company
Financial 6-0424
SEND MAIL: 9410 Drake Avenue
Evanston, Illinois

BEETS, EUGENE H. (Junior)
Assistant Traffic Engineer
U. S. Atomic Energy Commission
SEND MAIL: 183 Tacoma Road
Oak Ridge, Tennessee

CYSEWSKI, GERALD R. (Assoc.)
District Traffic Engineer
Washington Department of Highways
SEND MAIL: 5305 Fisher Place
Seattle 8, Washington

FOLEY, JAMES L., JR. (Assoc.)
Traffic Engineer, Chicago Plan Comm.
RA 6-8000
SEND MAIL: 2608 W. 99th Place
Chicago 43, Illinois

FORDE, ALBERT L. (Assoc.)
Traffic Engineer
Bureau of Street Traffic
709 City Hall
Chicago, Illinois RA 6-8000, Ext. 2133

FRITZSCHE, O. HERBERT (Assoc.)
Director, Div. Plann., Traffic & Economics
N. J. State Highway Department
SEND MAIL: 36 Ewing Avenue, Box 103
West Trenton, New Jersey

GALLAGHER, JAMES A., JR. (Junior)
District Traffic Engineer
Washington Department of Highways
4200 Main Street
Vancouver, Washington 3-4735

GERLOUGH, DANIEL L. (Junior)
Inst. of Transportation & Traffic Engrg.
Dept. of Engineers, Univ. of California
Los Angeles 24, California

GERVAIS, EDWARD F. (Assoc.)
Highway Traffic Engineer
Michigan State Highway Department
Lansing, Michigan 5-8144, Ext. 2108

GRAVER, ROBERT W. (Assoc.)
Traffic Engineer
California State Automobile Association
150 Van Ness Avenue
San Francisco 2, California

HIGGINS, HERBERT C. (Assoc.)
State Traffic Engineer, Dept. of Highways
Olympia, Washington 4471
SEND MAIL: Route 20, Box 147
Olympia, Washington

KELLY, ROBERT J. (Junior)
Junior Traffic Engineer, City of Chicago
SEND MAIL: 9836 Yates Avenue
Chicago 17, Illinois

MALONEY, FRANCIS T. (Assoc.)
Assistant Highway Engineer (Design)
Conn. State Highway Department
SEND MAIL: 95 Hillside Avenue
Waterbury, Connecticut

MUSICK, VIRGIL J. (Junior)
Junior Traffic Engineer
411-417 Lincoln Park Drive
Cincinnati 3, Ohio

NAGEL, JOHN T. (Assoc.)
Cook County Highway Dep., Chicago
SEND MAIL: 2447 New Street
Blue Island, Illinois

OLSON, MAURICE C. (Junior)
Assistant Civil Engineer
City of Glendale, California
SEND MAIL: 6656 Tujunga Avenue
Apartment 2, North Hollywood, California

RAFF, MORTON S. (Junior)
Mathematician, Bureau of Public Roads
Washington 25, D. C. Exec. 4950, Ext. 4894
SEND MAIL: 2623 Southern Avenue, S. E.
Washington 20, D. C.

STILL, REX G. (Assoc.)
Prin. Assistant Traffic Engineer
State of Washington Dept. of Highways
SEND MAIL: 530 O'Farrell Avenue
Olympia, Washington

Transfers

ASSOCIATE TO MEMBER

CORDER, LEON W.
GENEST, ADRIEN
LEROY, HOLDEN M.
MYERS, DWIGHT T.
ROBINETTE, PAUL S.
WOODLING, HERBERT B.

JUNIOR TO ASSOCIATE

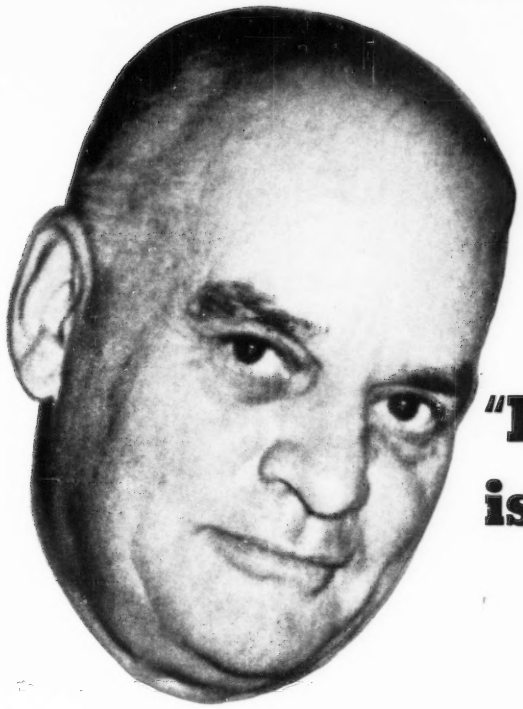
DABNEY, DAVID F.
LAWTON, LAWRENCE
PLUTAE, PAUL
WICHMAN, JAMES R.

New Lightweight Rolatape

A new, lightweight rolatape for accurate one-man measurement, vertically, horizontally or around curves has been announced by Rolatape, Inc.

The new unit permits safe and accurate measurements of from a few inches to almost unlimited lengths by a single individual. Recessed tape face on rim of wheel indicates measurement in fraction of inches up to 2 feet. Automatic Counter clocks measurements in feet and in cycles of 100 feet. In operation, an audible click is made for every two feet measured and a bell rings at the 100-foot mark.

A lightweight handle collapses down to 8 inches when not in use so that complete unit can be carried in glove compartment of any automobile. Further details can be obtained by writing Rolatape, Inc., 1415 14th Street, Santa Monica, California.



"Highway Safety is your business"

says **Rudolph F. King,**
Registrar of Motor Vehicles
Commonwealth of Massachusetts

IN an address before the Electric Institute of Boston, Inc., Mr. King made the following statement: "Darkness is so significant a traffic hazard that the prevention of only one-third of the adult pedestrian fatalities which occur after dark would save more lives than the elimination of all pedestrian fatalities in the daytime. Together—public officials and engineers—we can accomplish results which should minimize the condemnations of victims who cry out to us 'Make our Streets Safe! Beat Darkness, our worst killer'."

The Street and Traffic Safety Lighting Bureau, 155 East 44th St., New York 17, N. Y.

New Appointments

EDMUND R. RICKER began his new duties as Traffic Engineer for the New Jersey Turnpike Authority on September 15th. He resigned his position as City Traffic Engineer for New Haven, Connecticut, to accept the new responsibility.

Prior to his two year term as New Haven Traffic Engineer, Ed spent one year as Research Associate at the Yale Bureau of Highway Traffic. During this period, he wrote the book entitled "The Traffic Design of Parking Garages" published by the Eno Foundation in 1948.

Ed is a graduate in Civil Engineering from the University of Vermont, and took graduate training at Yale in Civil Engineering. He also attended the Yale Bureau in 40-41. His experience includes three years in construction and traffic engineering for the Vermont Highway Department, followed by five years with the U. S. Army Engineer Board where he was responsible for research and development of traffic control doctrine and equipment, course plotting equipment, and infrared equipment. Since publication of the book on parking garages, Ricker has acted as Traffic Consultant on the design of several garages.

In addition to membership in the Institute of Traffic Engineers, he is an Associate Member of the American Society of Civil Engineers and a registered professional engineer in the State of Connecticut.

ON THE SHELF

Compiled by
Mrs. Kathryn C. Cassidy
Librarian, Bureau of Highway Traffic

American Association of Motor Vehicle Administrators and The Motorists' Vision Committee of the American Optometric Association.

Manual on Drivers' Vision Test. Department of Public Information of the American Optometric Association, Pittsburgh. The purpose of this manual is to outline simple but adequate tests of vision and to indicate how they should be given. It is supplementary to the state manual on procedure for the license examiner and has been prepared in the hope that it may contribute toward further standardization of the visual examination now given throughout the United States.

Breese, Gerald William.

The Daytime Population of the Central Business District of Chicago, with Particular Reference to the Factor of Transportation. The University of Chicago Press. c1949. (A publication of the Chicago Community Inventory). One of a series of monographs on Metropolitan Chicago. Text, charts, maps, graphs, etc. reveal the population pattern of the central business district in daytime, the functions of the district, the origin and number of persons entering it, the means of transportation employed and the problems associated with the distribution of these elements.

Chicago, Mayor's Traffic Survey Committee for the Central Business District.

City of Chicago; Study and Recommendations for Improving Traffic Movement in the Central Business District. Survey of volumes and delays in private vehicle and street level transit operations, parking, influence of through trucks on traffic congestion, influence of empty taxicabs, etc. Includes maps, charts, etc.

Conference on Current Highway Problems.

Proceedings, April 29-30, 1949. Conference arranged by the Department of Civil Engineering through the Division of University Extension. The University of Tennessee Record, Vol. 52, No. 4, Knoxville, Tennessee. Contents: "Supplementary Roads," by T. H. Cutler; "State and County Relations," by Walter Johnson; "Status of the Federal-Aid Secondary Program," by A. C. Leonard; "Roadside Erosion is Preventable," F. W. Cron; "Side-Ditches and Slopes on Highway Construction," by Wm. N. Rees; "Research in Highway Engineering," by L. E. Gregg; "Practical Use of What is Known About Compaction," by A. W. Johnson.

Engineering Staff, Ohio Highway Study Committee.

Series or reports: *Engineering Procedures and Instructions for Determining State Highway Needs; Street Needs in Cities of 10,000 or More Population; Street Needs in Municipalities of Less Than 10,000 Population; County and Township Road Needs; and Report of the Traffic Engineers Advisory Committee,* The Committee, Columbus, Ohio, 1949.

Highway Research Board, Committee on Load Carrying Capacity of Roads as Affected by Frost Action.

Load Carrying Capacity of Roads as Affected by Frost Action. Research Report No. 10-D. The Board, 1950. This second report of the committee covers its work for 1949 and reviews the work of eight states cooperating in the project and contributing research data. It contains a manual of procedure for conducting the field plate bearing tests which insures that the various tests are made in a uniform manner.

Institute of Transportation and Traffic Engineering, University of California, Berkeley.

Opportunities for Study with the Institute of Transportation and Traffic Engineering. University of California Press. Description of the history and organization of the Institute, the facilities, staff, program, courses and research projects.

Kramer, Milton D.

Deft Driving. The Ford Motor Company. c1950. Pamphlet. Mr. Kramer, who is Assistant Director of the Center for Safety Education of New York University, has written this pamphlet to assist instructors of driving in simple teaching methods. It contains pictures and graphic representations of common traffic situations and is made up largely of questions and answers by which the driver may check himself, his knowledge, his judgments or his attitudes, or the teacher may use the questions in instruction. The emphasis is on skill in driving—learning to make driving a "fine art."

Morony, Louis R.

The Uniform Vehicle Code and the Model Traffic Ordinance; a Guide to a Better Understanding of the Nationally Recommended Laws. Automotive Safety Foundation. "This document is based on lectures presented at Judges and

22% more NET revenue from fewer meters

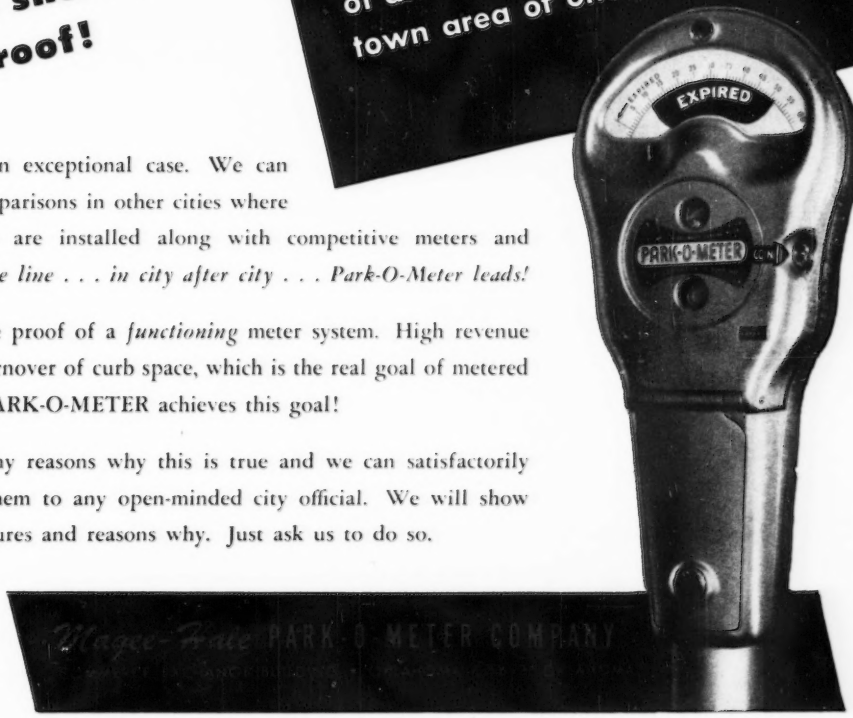
that's the amazing record of 840 PARK-O-METERS as compared with 854 meters of another type in the down-town area of one large city!

ask us to show you proof!

Nor is this an exceptional case. We can show you comparisons in other cities where Park-O-Meters are installed along with competitive meters and *right down the line . . . in city after city . . . Park-O-Meter leads!*

Revenue is the proof of a *functioning* meter system. High revenue means high turnover of curb space, which is the real goal of metered parking. . . PARK-O-METER achieves this goal!

There are many reasons why this is true and we can satisfactorily demonstrate them to any open-minded city official. We will show you actual figures and reasons why. Just ask us to do so.



Prosecutors Conferences at various universities by Louis R. Morony, Director, Uniform Laws Division, Automotive Safety Foundation. It was prepared as a section for a manual for Judges and Prosecutors to be published by the Northwestern University Traffic Institute and the American Bar Association."

National Automobile Dealers Used Car Guide Company.

Truck Reference Book. Washington, D. C. The Company, 1950 edition. $2.50 per year including all supplements. "This new Truck Reference Book places in the hands of car and truck dealers, and others in all branches of automotive industry, comprehensive, practical data, organized for quick, ready reference on all trucks manufactured from 1940 through current year models."

National Committee on Uniform Traffic Laws and Ordinances.

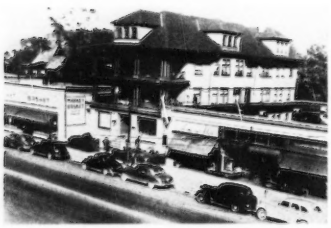
Licensing Operators and Chauffeurs; Explanatory Notes on Act II of the Uniform Vehicle Code. Washington, D. C. The Committee, 1949.

Alfco Twin Automatic Parking Meters

Alfco Twin Automatic Parking Meters are helping to solve the vexing traffic congestion problems in over a *hundred* cities and towns all over America.

In these communities, no muttering motorists are crumpling fenders while backing into too short a curb space; formerly exasperated truck drivers with their ten-ton trailers are now finding more open traffic lanes to move through town; weary workers homeward bound are no longer plagued with the traffic jams caused by minor traffic mishaps resulting from efforts to get in or out of cramped parking spaces.

A motorists' dream! Plenty of room in which to park—and to leave, with clearer vision of traffic lanes, a safer community for both pedestrians and riders. This is how the Alfco Twin Automatic Parking Meter is performing a vitally important public service, as well as reducing costs to the taxpayers for the purchase, installation, operation and maintenance of the meters.



Photograph of a typical Alfco Automatic Twin Parking Meter installation on a busy business street. Note the ample space for entry and exit.

One Alfco Twin provides parking space for *two* cars, and *ample* space for entry and exit for *both* cars.

Better traffic control, more space for motorists, better vision for both motorists and pedestrians, improved appearance of city streets, less maintenance cost, increased revenue, greater convenience to public generally. These are the gist of the many fine compliments which the Alfco Twin Meter is receiving from all over the country.

The Alfco Twin Meter is manufactured by International Meters, Inc. of Elmira, N. Y., a subsidiary of American-LaFrance-Foamite Corporation.

New Flex-O-Lite Plant

The Flex-O-Lite Manufacturing Corporation of St. Louis, Missouri, is erecting a new manufacturing plant and office building in St. Louis County. This plant will soon be completed, according to an announcement by G. M. Rizer.

Flex-O-Lite manufacturers reflective glass beads which are widely used for reflectorizing painted highway traffic signs, advertising signs, airport runway delineators and motion picture screens. Further information may be obtained by writing direct to the manufacturer.

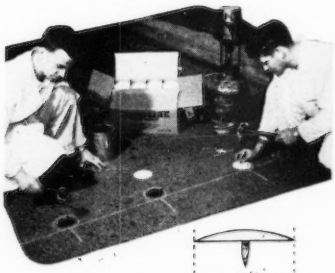
De Leuw, Cather & Company, Chicago, was awarded a contract recently for design and supervision of construction of the 88-mile, $31,000,000 Oklahoma Turnpike. The road will connect Tulsa and Oklahoma City.

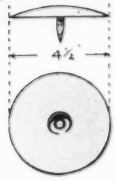
A portion of the work will be sub-contracted to Oklahoma engineering firms, but De Leuw, Cather will have full responsibility for successful completion of the project.

De Leuw Cather offices will be established in Stroud, Sapulpa and Oklahoma City. Field work will be directed from these offices.

SAVE 50% ON STREET MARKING COSTS WITH DUR-O-LINE

(Available in Safety White, or Traffic Yellow)





A TENITE PLASTIC STREET MARKING SYSTEM

No More Repainting Costs
No More High Labor Costs

- **DUR-O-LINE** markers pay for themselves in one year. Cost of DUR-O-LINE Markers installed equals average cost of 2½ paint jobs.
- **DUR-O-LINE** marked streets are more attractive—the brilliant 4½" markers do not fade or smear.
- **DUR-O-LINE** markers have three times the visibility of painted lines.
- **DUR-O-LINE** markers are designed to withstand severest traffic conditions. Load tests prove that they can carry 15 times the maximum legal load limit.
- **DUR-O-LINE** markers are easy to install. A two-man crew can lay 100 markers in an hour. No traffic tie-ups. Traffic can run over markers as workmen lay them.
- **DUR-O-LINE** markers can be used on either asphalt or concrete pavements.

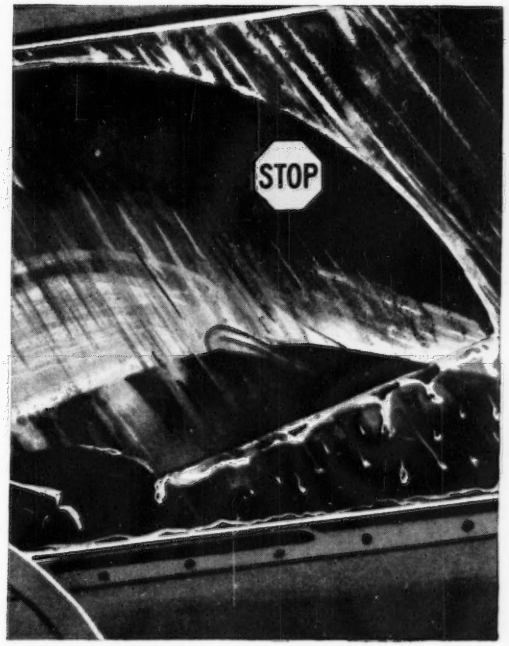
TRIAL OFFER

As a special offer 200 markers and laying material for 400 to 1200 linear feet is available for only $52. ($67. for concrete streets.) Test this sample offer on your busiest street. Shipped prepaid.

TRAFFIC SAFETY SUPPLY CO.
2700 NE Sandy Blvd., Portland 12, Ore.

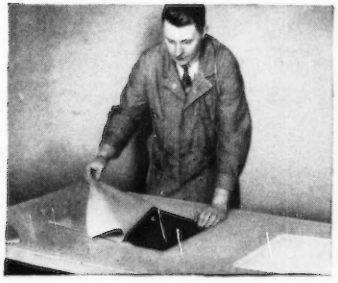
NEW "SCOTCHLITE" FLAT-TOP

Reflective Sheeting gives "fair weather" visibility in Rain...Sleet...Icing Conditions!



BECAUSE ITS SURFACE is smooth as glass, this new sheeting reflects with undiminished brightness under any form of moisture. Even in cloudbursts, sleet, or under glare ice, this new material flashes back its safety message clearly and brilliantly.

EXTRA EFFECTIVE—because signs reflectorized with "SCOTCHLITE" Sheeting reflect the *complete* sign—true shape, true color, entire message. And 3 years of testing proves this brilliance *lasts*. Glass-smooth surface stays clean as finest enamel.



EASY TO APPLY — simply strip off protective backing to expose dry, pre-coated adhesive. Wipe on adhesive activator and sheeting is ready to apply. If you use a vacuum applicator no liquid activator is necessary; heat will activate the adhesive. No separate adhesive cans, brushes, spray guns, drying racks!

READY-MADE SIGNS may be had from your supplier with regular "Scotchlite" Reflective Sheeting. All meet U.S.B.P.R. specifications, including rounded lettering. Write today for price list and samples. We'll also have a representative call if you wish. Address Dept. TE100, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

REG. U.S. PAT. OFF.
SCOTCHLITE
BRAND
REFLECTIVE
SHEETING

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives.

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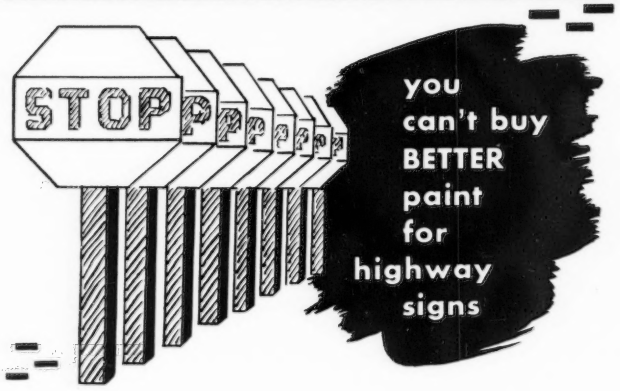
Weatherproof
Silk Screen Enamel

LONG LIFE • HIGH GLOSS



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High gloss, brilliant color enamels that withstand exposure indefinitely. These enamels are easy working, cover more space, lower your costs. Used exclusively by many states.

Silk, squeegees, stencil knives, photographic plates — EVERYTHING YOU NEED FOR FINE SILK SCREEN PRINTING. Write for Catalog No. 26 and further information.

THE NAZ-DAR COMPANY • 469 MILWAUKEE AVE. • CHICAGO 10, ILL.

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THE MIRO-FLEX COMPANY will not substitute inferior materials in the manufacture of its established sign line, i. e., TRAFFIC CONTROL — HIGHWAY MARKING AND STREET NAME ASSEMBLIES. Users of these signs should anticipate their needs and allow for a reasonable delay. Raw materials are extremely critical, and we feel it our duty to ask MIRO-FLEX customers to safeguard their interests. We will do our very best to maintain stocks of standard stock items. Your inquiry invited.

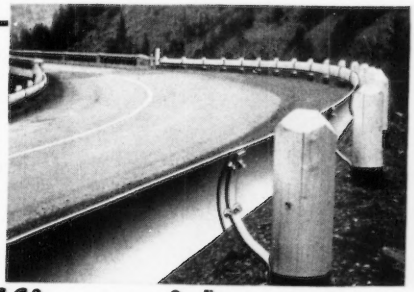
MANUFACTURED BY

MIRO-FLEX CO., INC.

1824 EAST SECOND STREET—WICHITA, KANSAS

Exceeds all state safety specifications

TUTHILL HYWAY GUARD



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YOURS FOR THE ASKING.....

A NEW GRANITE CURB FOLDER 7T—Containing complete specifications on fabrication and setting of Standardized Granite Curb, also detail drawing of high speed highway entrances and exits. Every traffic engineer should have it.—Write for your free copy today.

H. E. FLETCHER CO. GRANITE

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Beautiful, Legible, Low-Priced

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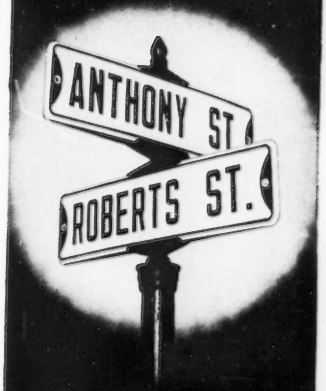
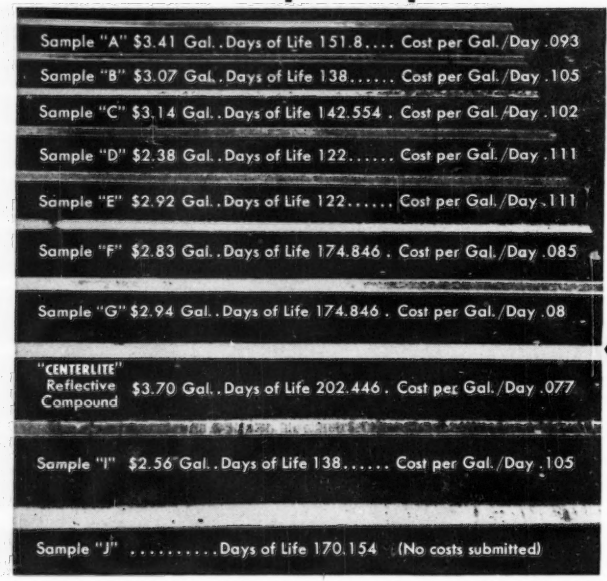


WRITE FOR CATALOG

Cataphote Corporation

TOLEDO, OHIO

"CENTERLITE" Compound tops all others in District of Columbia road test!


Sample "A" $3.41 Gal. . Days of Life 151.8.... Cost per Gal./Day .093
Sample "B" $3.07 Gal. . Days of Life 138..... Cost per Gal./Day .105
Sample "C" $3.14 Gal. . Days of Life 142.554 . Cost per Gal./Day .102
Sample "D" $2.38 Gal. . Days of Life 122..... Cost per Gal./Day .111
Sample "E" $2.92 Gal. . Days of Life 122..... Cost per Gal./Day .111
Sample "F" $2.83 Gal. . Days of Life 174.846 . Cost per Gal./Day .085
Sample "G" $2.94 Gal. . Days of Life 174.846 . Cost per Gal./Day .08
"CENTERLITE" Reflective Compound $3.70 Gal. . Days of Life 202.446 . Cost per Gal./Day .077
Sample "I" $2.56 Gal. . Days of Life 138..... Cost per Gal./Day .105
Sample "J" .....Days of Life 170.154 (No costs submitted)

IMPARTIAL TEST shows "Centerlite" Compound lasts longer, shines brighter, COSTS LESS than nine competing pavement markers!

Samples of 10 leading reflective pavement markers were applied to a section of heavily traveled roadway in a recent test by a District of Columbia authority. Two samples failed after 122 days of wear. After 138 days those remaining were rated for reflective power, durability and general appearance. From this, actual costs were computed (gallon price, including labor, divided by the number of days of useful life).

The picture at the left was taken after 191 days of constant 12,000-vehicle-a-day wear. As you can see all the strips have failed except "Centerlite" Reflective Compound, which is still going strong. On a cost basis too, "Centerlite" Compound shows the way!

REG. U.S. PAT. OFF.
CENTERLITE
BRAND
REFLECTIVE COMPOUND

GIVE "CENTERLITE" COMPOUND a test on your toughest stretch of road. Write Dept. TE-105 for details.

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Reflective Sheeting, "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives.

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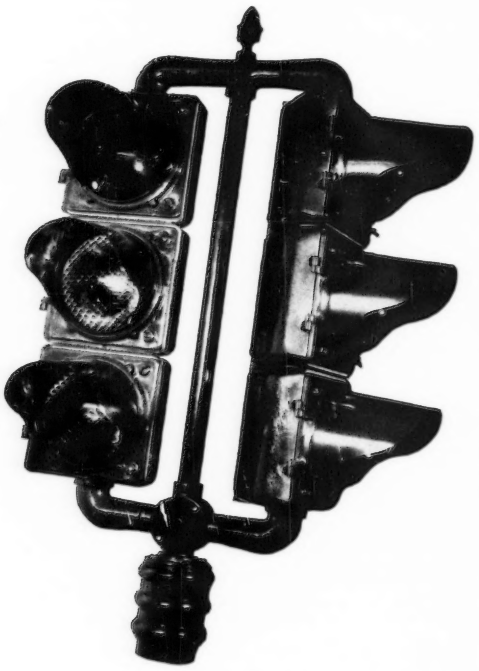

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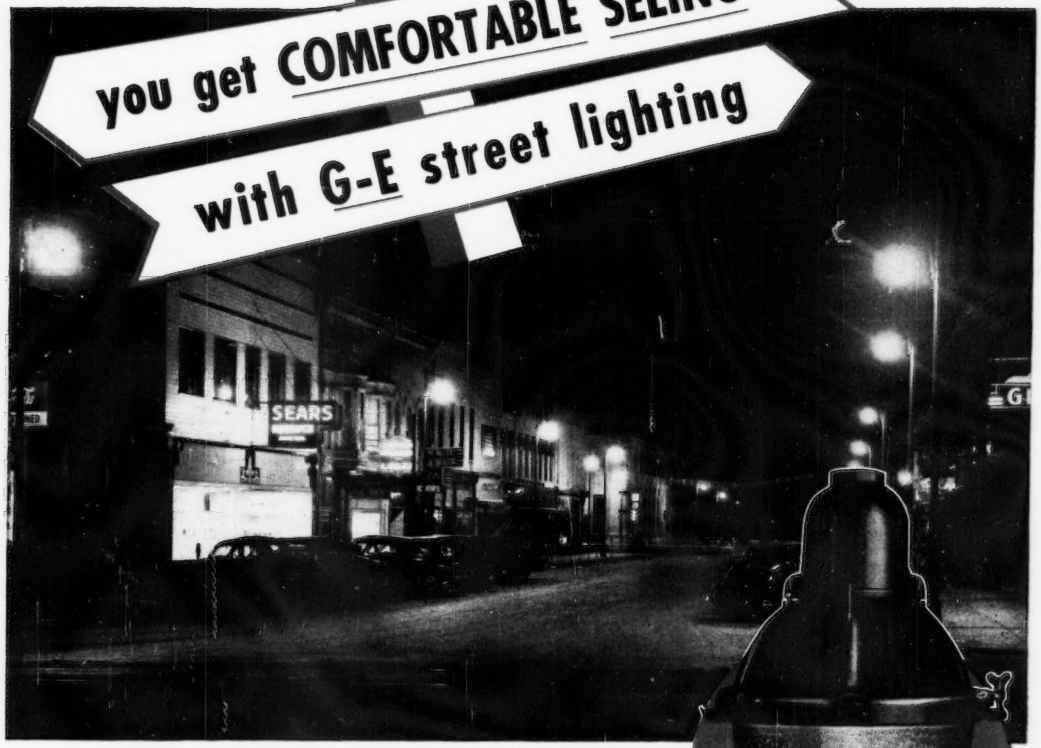
you get COMFORTABLE SEEING* with G-E street lighting



Comfortable Seeing—the light you need, exactly where you need it, economically

Here's Seymour, Indiana, another town that has switched from dangerous darkness to leadership in light. City officials realized the inadequacy of their 20 year old lighting system, and that proper lighting would be a business attraction. With the help of their local utility, Seymour decided on a General Electric Comfortable Seeing installation for their business and residential areas.

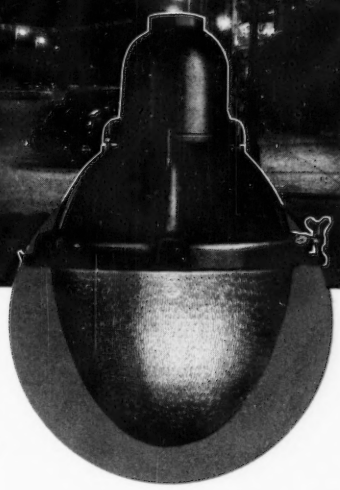
Now the business streets are flooded with soft, eye-easing light—brightening the store fronts for shoppers—uniformly illuminating the street for the safety of both pedestrians and drivers.

The light on Seymour's residential streets is being more than doubled as old-style radial-wave reflectors are replaced by modern Suburban Reflectors. Photo-electric cells in the modern control circuit automatically turn lights on when they are needed.

TRADE FOLLOWS THE LIGHT

Business streets should be lighted in a manner which favorably influences and attracts night-time shoppers. Lighting and background are often just as important in motivating sales as the merchandise itself. This has long been recognized in connection with show windows and store interiors, but only in recent years are the psychological possibilities of exterior illumination being realized.

Plan on Comfortable Seeing when relighting your town. General Electric has the luminaire which will exactly meet the needs of your business districts, and residential areas. The lighting specialist in the nearest G-E Apparatus Department Sales Office can give you all the details. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*



This is the Form 79AS an effective luminaire for main street lighting

It's a large-size ornamental unit with a circular light distribution (I.E.S. Type V). Has an Alzak† processed aluminum reflector, light-diffusing rippled globe, die-cast aluminum casing and hinged globe holder. Burns 4000 to 15,000-lumen series lamps, 300- to 860-watt multiple lamps.

†Manufactured under patents of the Aluminum Corporation of America.

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